ENGINEERING NEWS-RECORD

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UNIVERSITY MICROFILMS IN
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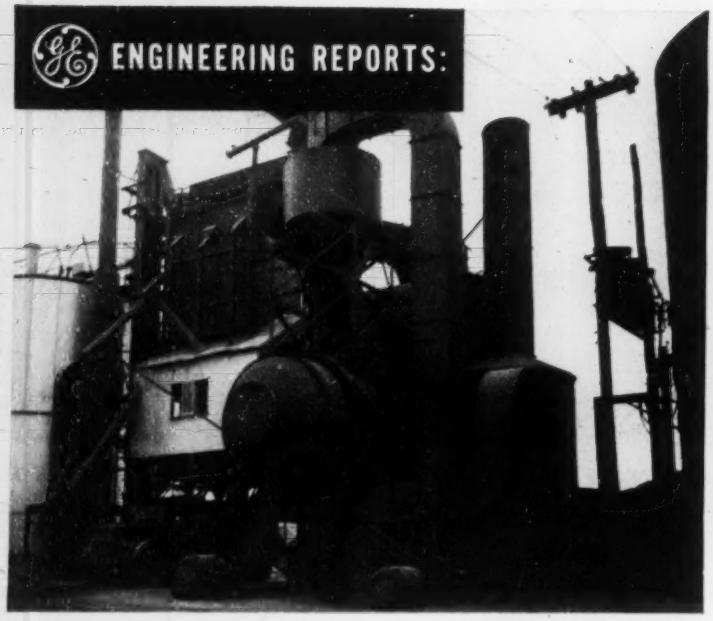
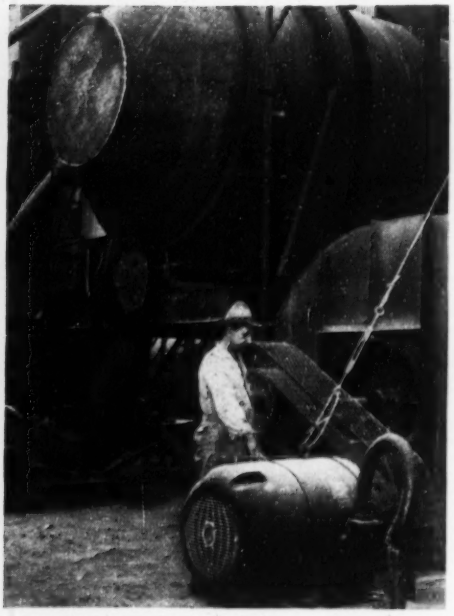
A McGRAW-HILL PUBLICATION

ENGINEERING REPORTS:



G-E SERVICE is quickly available to any Simplicity-built plant. An asphalt plant must be dependable above all — no G-E motor has failed in this Triboro Asphalt Co., Flushing, N. Y., installation since its construction in 1949.



ECONOMICAL OPERATION is one advantage of using General Electric drives. This 100-hp G-E motor operates main dust blower at Triboro.

Large asphalt-plant builder standardizes on General Electric equipment for dependability

G-E motors and controls help maintain continuous high output at Simplicity-built plants

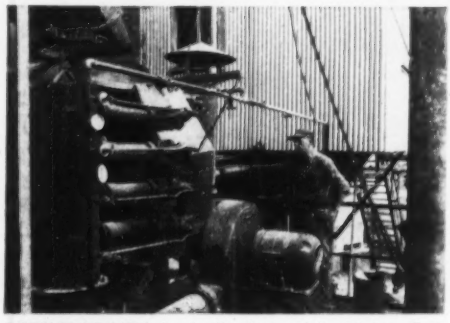
The Simplicity System Co. of Chattanooga, Tenn., has used General Electric motors and controls since they first electrified this type of asphalt plant. W. C. West, Simplicity general manager, says "We not only feel G-E apparatus is the most dependable of any available, but for years we've been highly pleased with G-E service."

Reliable, flexible motors are required for these applications. Simplicity-built plants are often remotely located at the end of utility lines or where power availability is low. Drive motors are subjected to very high starting torques. Even a one-hour shutdown can cost more than a thousand dollars in lost production alone. Because of these conditions, G-E motors designed to operate under high starting torques and low starting currents were selected after Simplicity ran a series of tests for various applications, in co-operation with G-E engineers.

Your construction equipment will gain in dependability and efficiency too, when you electrify with G-E drives and power distribution equipment. They're backed by G-E engineering help in application, installation and service, available through any G-E Apparatus Sales Office, or by writing General Electric Co., Section 664-33, Schenectady, N. Y.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC



DEPENDABILITY is built into this 25-hp G-E motor, which operates the burner controlling the temperature and consistency of asphalt mixture.

CENTRALIZED G-E CONTROL PANELS are factory assembled and system-wired; they provide safer control for all motors in a Simplicity plant.

HYDRAULICS FOR MOBILE EQUIPMENT
VOL. 2

Mobile Equipment News

VICKERS INCORPORATED, DETROIT, MICHIGAN

IMPROVES PERFORMANCE • CUTS COSTS
NO. 4

VICKERS® VT16 PUMP NOW AVAILABLE FOR HYDRAULIC POWER STEERING OF TRUCKS AND MATERIALS HANDLING VEHICLES

The Vickers Series VT16 pump is used more widely than all other makes combined for the power steering of automobiles. It is now available for the first time for the hydraulic power steering of trucks and materials handling vehicles. It has all the characteristics important to this service and is used in a separate hydraulic circuit for steering only.

COMPLETE PACKAGE

Series VT16 has integral volume control valve and relief valve . . . also an integral oil reservoir. This is a complete hydraulic power package for steering.

SIMPLIFIED INSTALLATION

This compact and complete power package is easily and quickly installed. All you need to do is bolt it on, make two hydraulic connections, and couple the power.

LONGER PUMP LIFE

The exclusive Vickers "Hydraulic Balance" eliminates pressure-induced bearing loads and the consequent wear. These lighter bearing loads mean much longer bearing and pump life.

NO LOAD STARTING

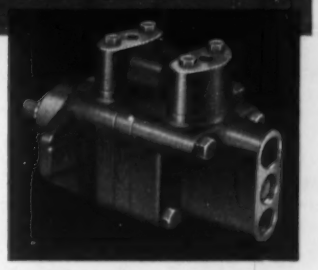
At rest and normal starting speeds, the sliding vanes are retracted; only after engine fires do vanes extend and pumping begin.

ASK FOR BULLETIN M-5104A

Series VT16 Vickers Pump with integral volume control and relief valves and oil reservoir. For hydraulic power steering.

HIGH OPERATING EFFICIENCY

The vane type construction, hydraulic balance and automatic maintenance of optimum running clearances enable these pumps to deliver more oil with less power. This high operating efficiency is maintained throughout the long pump life.



Series VT17 Vickers Pump is similar to the VT 16 except that it does not include the oil reservoir.

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FOR THE "RIGHT" ANGLES USE

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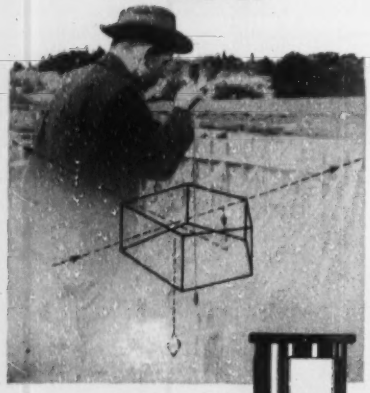

WILD Optical Squares, tiny surveying instruments containing pentagonal prisms, will do the complete job of laying out and checking buildings, concrete forms, ditches, pole lines, boundaries, etc., as well as cross sections and topo maps.

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Washington - REpublic 7-6630

Number of copies of this issue printed 65,070

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Robert F. Boger
Publisher

October 28, 1954 ENGINEERING NEWS-RECORD Vol. 153, No. 18

Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y.

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 North Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are solicited only from persons with an identifiable commercial or professional interest in construction and buildings. Position and company connection must be indicated on subscription orders.

Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada $8.00 a year; $12.00 for two years; $16.00 for three years. Other Western Hemisphere and the Philippines, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A. Copyright 1954 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

here's the backbone of the highway...

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Embedded in the concrete pavement, in the base course or in the asphaltic concrete surface, Clinton Welded Wire Fabric is the steel reinforcement that literally holds the highway together. The heavy, welded wires give positive mechanical anchorage of the concrete which means better load distribution and controls cracking.

Clinton Welded Wire Fabric is available in a wide variety of gauges and spacings for all reinforcing requirements. It meets all A.S.T.M. and A.A.S.H.O specifications.

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32' TO 96'

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BUILDING PRODUCTS
STEEL TRUSSES • STEEL DECK

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CANTON 1, OHIO

• ENGINEERING • FABRICATING AND ERECTING •

B.F.Goodrich

Tires roll from pit to plant on rock-strewn roads, defy cuts!

THE roads that connect the mining pits with the Charleson Iron Mining Company's plant at Virginia, Minn., are covered with chunks of abrasive rock and stone. Trucks roll over these roads 24 hours a day, 7 days a week, carrying 17-ton payloads.

Tire mortality could be high. This company uses B. F. Goodrich Universal tires, reports they defy rock cuts.

All-Nylon cord body

They wear longer, too, because Universal tires, size 12.00 and larger, are built with an all-nylon cord body. Nylon is stronger than ordinary cord materials, withstands double the impact, resists heat blowouts and flex breaks.

Under the tread is the B. F. Goodrich nylon shock shield. Layers of strong nylon cords stretch together to absorb and distribute impacts, protect the tire body from shocks and bruises. This means Universal tires wear longer, can be recapped more times. You pay nothing extra for this patented B. F. Goodrich nylon shock shield.

See all-nylon tires today at your B. F. Goodrich retailer's (smaller sizes in all-nylon or rayon construction). The address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

TONS OF ROCK crash onto B. F. Goodrich Universal tires that will carry the load up steep hauling roads to the plant. BFG makes a complete line of off-the-road tires.

CHARLESON'S TIRES are 95% B. F. Goodrich, preferred because the specially-compounded tread defies rock cuts, gives outstanding traction compared to other rock-type tires.

Specify B. F. Goodrich tires when ordering new equipment

3 mighty Manitowoc 3000's

lick 500,000 yards of rock for DINARDO, INC.

Once again, Manitowocs are chosen to handle a rough, tough rock job. Approximately 700,000 yards of rock and shale are included in Dan Dinardo's contract on the reconstruction of State Route 88 near Sewickley, Pa. Three big Manitowoc 2½ yd. shovels were selected to handle the toughest 500,000-yard section on the job.

Dinardo depends on the Manitowocs to whip the meanest stretches and slug out the biggest part of the job — and yet, there is less down time with the Manitowoc's than any other shovel on the project. That's the big advantage of having Manitowoc's rugged construction, fast working speeds and tremendous power at the dipper, working for you.

Do what Dan Dinardo does—and what contractors all over the nation are doing—put a Manitowoc on *your* job and protect your margin of profit.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

two-way side dumping eliminates truck tie-ups ... keeps rock production high

Assurance of constant, smooth flow of rock from quarry to crusher and elimination of costly truck delays have been achieved by Buffalo Crushed Stone Co. of Bowmansville, N. Y. through a flexible system of two-way side dumping at the crusher.

The greater flexibility of this system was achieved by converting from single truck units to truck-trailer combinations—thus doubling payload capacity for stepped-up production. Since all the dump bodies are designed for two-way dumping, the trucks can roll in on either side of the crusher. Remote-control overhead dumping system enables one man to control the feeding rate and the crusher operation. Feed is uniform...truck delay is eliminated.

Each of the six trucks hauls 28 tons in two side-dump bodies; 14 tons on the truck and 14 on the trailer. They handle grades up to 10% and roll at speeds up to 27 m.p.h. on the level. Each truck makes 22 trips daily between the quarry and the crusher, hauling a total of 3700 tons and using only 1.2 gallons of diesel fuel per hour per truck.

In switching to tandem operation, Buffalo Crushed Stone Co. knew they had a job calling for trucks that "have what it takes." Result: They bought Macks—six Model B-61 six-wheelers powered by Mack Thermodyne® Diesels, and equipped with heavy-duty Mack transmissions to meet stiff grade requirements.

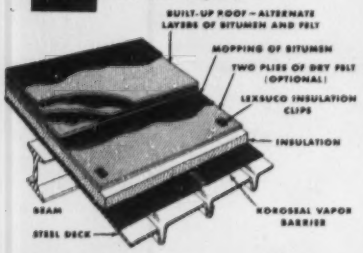
On your job, too, Mack trucks can make the big difference by hauling more—for less.

2716

MACK TRUCKS Empire State Building, New York 1, N. Y.

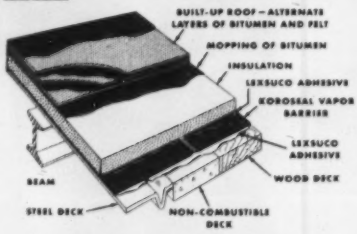
5 LEXSUCO ANSWERS FOR TODAY'S ROOFING PROBLEMS

1 **Over steel deck . . . Koroseal Vapor Barrier**



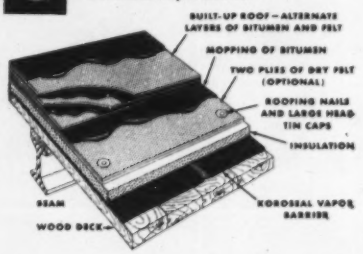
✓ *fire-retardant* ✓ *vapor-resistant*
✓ *uses self-locking Lexsuco Clips*

2 **Over steel, concrete or wood deck . . . Koroseal Vapor Barrier**



✓ *fire-retardant* ✓ *vapor-resistant*
✓ *uses fire-safe Lexsuco Adhesive*

3 **Over wood deck . . . Koroseal Vapor Barrier**


BUILT-UP ROOF – ALTERNATE LAYERS OF BITUMEN AND FELT
MOPPING OF BITUMEN
TWO PLIES OF DRY FELT (OPTIONAL)
ROOFING NAILS AND LARGE HEAD TIN CAPS
INSULATION
BEAM
WOOD DECK
KOROSEAL VAPOR BARRIER

✓ *fire-retardant* ✓ *vapor-resistant*
✓ *uses standard nails and tin caps*

Engineered products for the construction industry

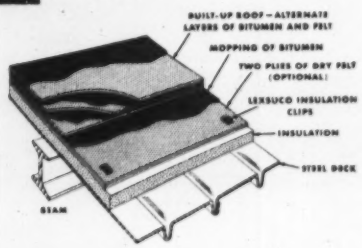
Modern requirements for built-up roofing demand improved fire resistance and greater vapor impermeability —and Lexsuco answers the problem with its new roof designs featuring Koroseal Vapor Barrier.

Lexsuco Roof Constructions are fire-retardant and vapor-resistant; can be applied over any type roof deck; utilize standard built-up roofing; can be specified with or without a vapor barrier; and provide superior roofing at no more cost than conventional roofing.

Koroseal Vapor Barrier is a tough, elastic sheet that gives excellent resistance to vapor transmission and will not contribute burnables to a plant fire below. Other Lexsuco innovations include Lexsuco Clips and Lexsuco Adhesive for high-strength, non-inflammable fastening of Koroseal and/or insulation to deck.

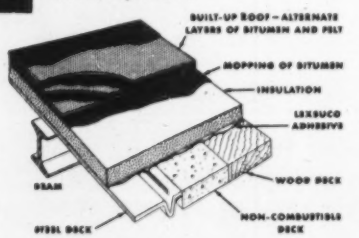
Analyze the five Lexsuco roof designs presented here . . . then specify "Lexsuco Roof Construction" for all your built-up roofing applications—it's yours at no extra cost.

4 **Over steel deck . . . no vapor barrier**



✓ *fire-retardant* ✓ *uses self-locking Lexsuco Clips*

5 **Over steel, concrete or wood deck . . . no vapor barrier**



✓ *fire-retardant* ✓ *uses fire-safe Lexsuco Adhesive*

For a new bulletin containing technical data and specifications on Lexsuco Roof Constructions, write: Lexsuco, Incorporated, 4817 Lexington Avenue, Cleveland 3, Ohio.

LEXSUCO
INCORPORATED

READER COMMENT

Hurricane vs lift slab

SIR: In regard to your article, "Lift slab collapses when pipe columns fail" (ENR July 29, p. 25) we would like to show another side of the lift slab picture, entitled "Lift slab withstands hurricane Carol."

During the latter part of August, 1954, we were lifting a two-story section of the Northeast Elementary School in Waltham, Mass. The slabs for this school were supported on 6-in. pipe columns, which we had guyed before lifting to prevent the tops from moving. Once the columns were guyed, there was no indication of weakness or bending.

We had the roof slab lifted to its proper elevation and permanently secured when hurricane Carol struck. The second floor, however, had been lifted to its final elevation, but not secured. The winds blew at 93 mph, with gusts up to 125 mph. A number of trees were blown down surrounding the school site, but the slab hung on the lifting rods and jacks during the entire storm.

We feel that hurricane Carol was a severe test for our lifting equipment and the building structure itself during this stage of construction.

ROBERT M. EGELHOFF
Executive Vice President
New England Lift Slab Corp.
Boston 16, Mass.

CALENDAR

Plastics in Building, conference being sponsored jointly by the Society of the Plastics Industry, Inc., the Manufacturing Chemists Association, and the Building Research Advisory Board, at the National Academy of Sciences, Washington, D. C., Oct. 27-28.

American Concrete Institute, regional meeting, Statler Hotel, Los Angeles, Oct. 28-29.

Engineers Council for Professional Development, annual meeting, Alms Hotel, Cincinnati, Oct. 28-29.

Air Pollution Control Association, semi-annual technical conference, Biltmore Hotel, Los Angeles, Nov. 4-6.

Structural Clay Products Institute, convention, Hotel del Coronado, Coronado, Calif., Nov. 6-10.

American Association of State Highway Officials, annual meeting, Olympic Hotel, Seattle, Wash., Nov. 9-11.

Hot Mix Asphalt Paving Associations, national meeting, Conrad Hilton Hotel, Chicago, Nov. 12.

Building Research Institute, research conference on modular measure, National Academy of Sciences, Washington, D. C., Dec. 9.

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Big 11′ x 7′ bowl and low rear-entry makes Tournarocker excellent target for 2-yd. shovel. All-steel triple bottom withstands impact of the boulders which range from 6 inches to 5 ft. in diameter on this job. Capacity load of 6½ to 7 bank yards takes 4 passes of dipper.

Relocation will place road 400′ above the river bed. Before assignment to this job, Dennis used his Tournarockers to build a 20-mile highway in Crater Lake National Park and to level a plant site for Alcoa Aluminum Co. in Wenatchee, Washington. Rig needs space only 12′1″ wide to turn around non-stop.

Maneuverability pays off at Lookout Point Dam

3 D Tournarockers work fast in 27′ to 33′ widths to relocate mountain road above new water level

When G. D. Dennis & Sons, Portland, Oregon, contracted with the U. S. Army Engineers to relocate 4.2 miles of County Road 360 at Lookout Point Dam, they brought in 3 D Tournarockers to haul the 265,000 cubic yards of material involved in the project.

With work 75% complete, the 122 hp 9-ton units have kept job ahead of schedule despite rainy weather and large boulders which slow loading and boost weight of material to 4000 lbs. per cu. yd.

Each unit moves 52 to 56 yds. hourly

Working on a cliffside about 400′ above the Willamette River, the Tournarockers load on a ledge only 33′ wide and dump from a ledge only 27′ wide. Short turn radius (12′1″) lets the "D's" position quickly, easily. Time studies, taken with the Tournarockers loading material containing about 65% rock, show each unit moved 6½ to 7 bank yards per trip. The large number of boulders in the material upped average load time with 2-yd. shovel to 1¾ minutes. Despite these adverse conditions, each unit still completed a 1300′ cycle every 6½ minutes (including ½ to 1½ minutes waiting time) . . . delivered 8 loads (104 to 112 tons) hourly.

Versatility earns repeat order

The Company bought their first pair of "D's" in May, 1950, added the third the following year, had a fourth on the way when photos were taken. "We've had our D Roadsters for 3 years using the prime-movers with both Scrapers and Rockers," says Supt. Donald G. Dennis. "We're particularly impressed with their maneuverability in close places. These machines have done a fine job not only in widening shoulders on highways and construction of narrow access roads, but in leveling plant sites."

It will pay you to investigate Tournarockers. Your LeTourneau-Westinghouse Distributor has job-proved facts and figures from work similar to yours. He will also gladly demonstrate the "D" on your work . . . either with a 10-yard Rear-Dump body, interchangeable 7-yard Scraper, logging arch and winch, or 10-ton crane.

Tournarocker—Trademark Reg. U.S. Pat. Off. DR-547-H-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ENGINEERING NEWS-RECORD

Vol. 153, No. 18 October 28, 1954

Number of copies of this issue printed: 65,070

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THE CONSTRUCTION WEEK

ATOM STUDY—There are some well-known names for construction men in that nine-company group AEC appointed to look into the possibilities of a nuclear power reactor for the western U. S.:

Ebasco Services, Fluor Corp., Arizona Public Service, Minnesota Mining and Manufacturing, Colorado Public Service, Idaho Power, Utah Power and Light, Phillips Petroleum.

First step will be to look into feasibility—water supply, availability of fuel, cost of construction.

PUBLICITY PROBLEM—Wheeling, W. Va. was having financial jitters over the effect of what it claimed was sensational reporting of a recent flood on the cranky Ohio River.

Newspapers said Wheeling's flood (ENR Oct. 21, p. 23) was a "disaster" and that 10,000 residents were evacuated. These accounts brought a flood of inquiries to city officials from bond brokers who have been considering a proposed $7.5-million bond issue to finance a new sewage disposal plant.

Snorted Mayor C. J. Schuck: "Bad reporting." Fact was, he added, only about 100 families had to be evacuated, only a few low-lying areas of the city were inundated; the flood would have no effect on the sewage disposal plans.

There was a joker in the whole thing, though. Schuck insisted the flood wasn't as bad as the 1952 flood; Army Engineers reported the crest at Wheeling at 44.7 ft—higher than in 1952.

ACCESS OR NO—Ohio's highway director had no right to deny access to some property owners, permit it to others on U. S. Route 40 near West Jefferson, said the state's court of appeals.

Case arose when the highway director declared the four-lane divided highway (under construction in 1950) to be limited-access, but permitted access by some abutting owners.

Said the court: Police powers don't excuse equal protection of the law due all property owners.

BETTER DETOURS?—Arizona's highway officials sought to end long-standing motorists' complaints about detours in general with a new set of detour standards:

Contractors must: keep the detour clear of rocks and hazards as smooth as "reasonably feasible"; maintain proper signs, lights, barriers; employ flagmen and pilot cars. Engineers must: avoid long time lapses in completion of projects; see to it that contractors maintain water trucks to keep down dust; lay out schedules so that long stretches won't be torn up at the same time.

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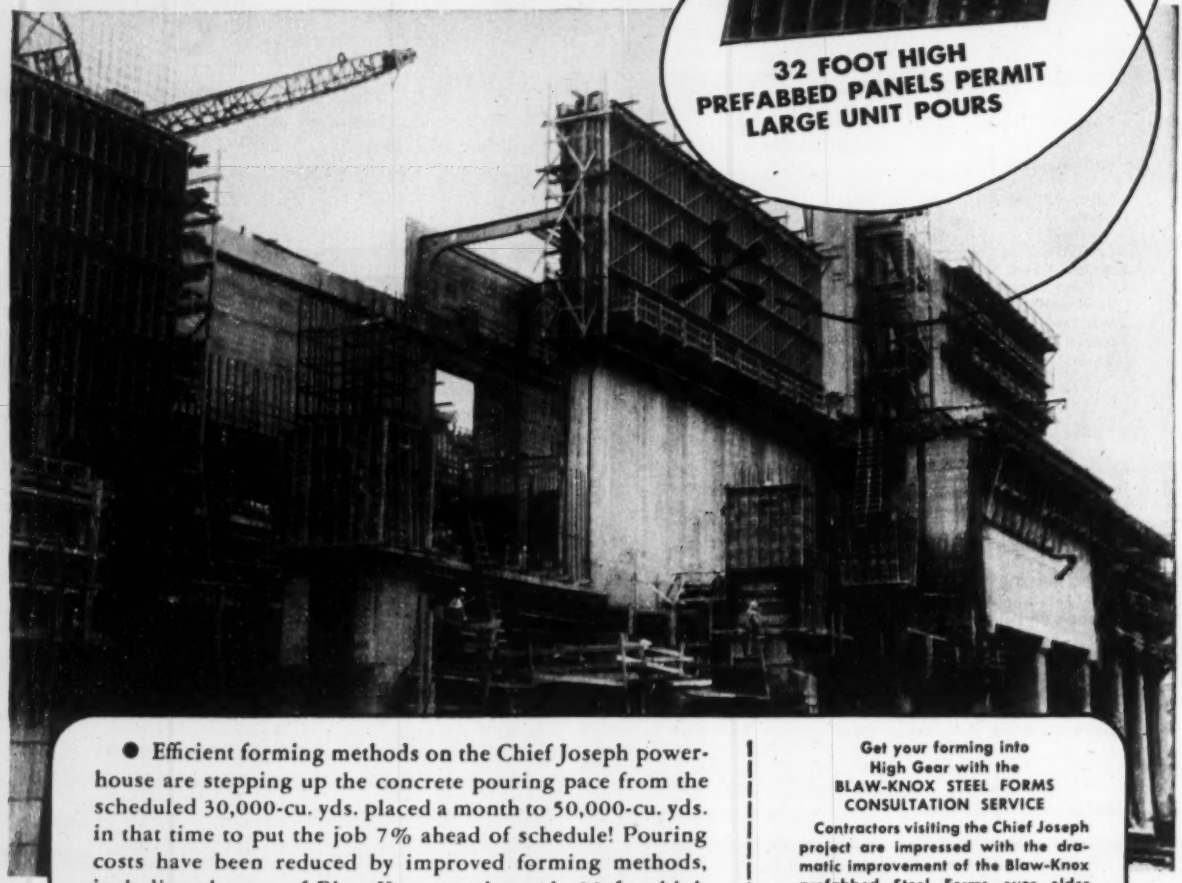

● Efficient forming methods on the Chief Joseph powerhouse are stepping up the concrete pouring pace from the scheduled 30,000-cu. yds. placed a month to 50,000-cu. yds. in that time to put the job 7% ahead of schedule! Pouring costs have been reduced by improved forming methods, including the use of Blaw-Knox steel panels 32 feet high which permit pours up to 70-ft. long in some of the massive solid walls. By re-using these forms, 80% of the concrete will be formed against the prefabbed panels.

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WASHINGTON OBSERVER

Administration's pre-election outlook for construction next year was spelled at the annual outlook conference of the Department of Agriculture—a session that always rates high with business forecasters:

In general, construction will be as good as this year or better.

State and local construction expenditures will be up $2 billion. That's the same increase we had this year. Highway building is a big factor.

Housing boom "seems likely to be maintained" next year, based largely on the showing of new starts this fall from easier credit terms of the new housing legislation.

Commercial and institutional building will rise again, partly boosted by the trend of population to the suburbs.

Only a couple of construction areas show a downward trend.

Industrial construction probably will continue the slide that has set in this year. But the decline is expected to continue to be moderate, rather than a sharper drop-off.

Federal spending is expected to decline slowly but it's hard to say just how much federal construction projects will be affected.

•

Building trades will fight any CIO attempts to get into building construction. Craft unions complain the present no-raiding pact isn't doing a job, and will be amended when it expires at the end of next year. AFL wants to make sure that craft unions do construction work in plants even if CIO has the production workers there. Particular AFL gripe is the CIO steelworkers, who refused to sign the no-raid pledge.

•

Congressional hearings on construction keep going, despite election nearness.

$40-million Washoe power and irrigation project for Nevada has been okayed by McKay, and Sen. Malone's subcommittee held hearings this week in Reno to give local people chance to praise, criticize, and comment. If Nevada and California approve, congressional approval will be sought next year.

Senate Public Works Committee may take up 36 lease-purchase contracts when the Senate comes back after election to debate McCarthy censure. The House already has approved the projects, totaling about $69 million of construction.

Hearings on $10 billion of federal aid to school construction may be held after election if Republicans win. Rep. Kearns of House Labor and Education committee is pushing hard for his bill to broadside federal money for schools, instead of aiding only so-called federally impacted areas.

•

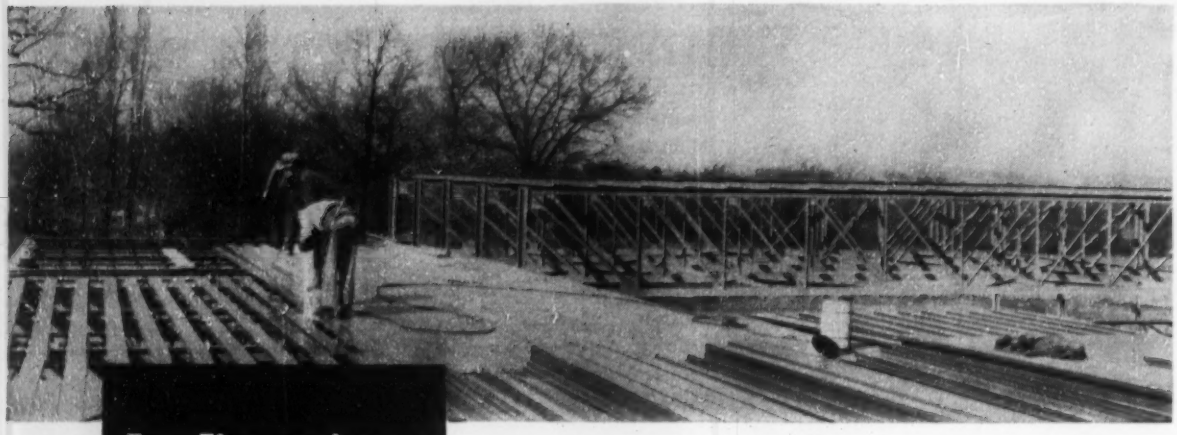
First studies on the Priest Rapids "local partnership" project will get under way now that the Federal Power Commission authorized the Grant County Public Utility District No. 2 to begin studies. The 1.6-million kilowatt project was authorized by Congress last session. It will be built on the Columbia River, with federal-PUD participation.

•

Air Force officials cite bids where concrete still beats asphalt under the new rules of the road. Asphalt interests protested favoritism for concrete and got a rule change some months ago that gives the two materials an even break except where special needs require concrete. But since the Air Force-imposed price differential favoring concrete was killed, concrete has won out on at least two jobs on a straight competitive basis:

At Blytheville, Ark., all-concrete beat asphalt by more than $250,000—$3,209,000 to $3,566,000.

At Lincoln, Neb., all-concrete for heavy-duty taxiway was less by about 4%. Concrete got the award at $434,000.



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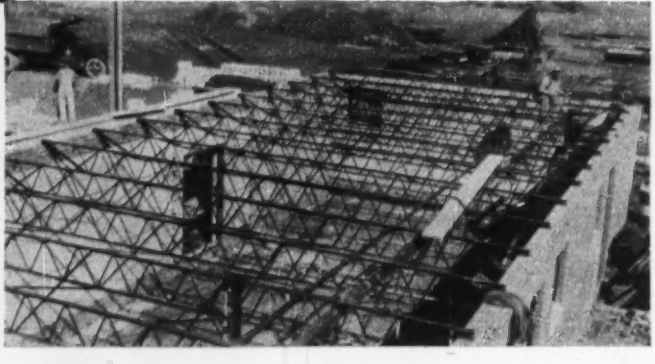

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ASCE president reveals bid definition study

A vigorous affirmation of the stand of the American Society of Civil Engineers against bidding for professional services—coupled with a sharply worded criticism of conduct "bordering on the obscene" by some engineers in their attempts to obtain public jobs—marked the opening of the term of a new ASCE president last week.

William R. Glidden (ENR Oct. 14, p. 25) who took office at the society's annual meeting in New York, devoted a major part of his inaugural address to the long-standing controversy, and supported the action of the ASCE's Board of Direction in disciplining members for bidding on two jobs in South Carolina. There, "the issue was drawn so sharply as to imply defiance" (of the society's code of ethics), said Mr. Glidden.

In the course of his remarks, Mr. Glidden also revealed that the society's Committee on Professional Practice has been charged with the task of developing a clear definition of what constitutes bidding on a price basis, so that the wording on this matter in the code of ethics may be better understood.

"On border-line questions in this category," he commented, "such a definition will be most helpful."

• **Two-way responsibilities**—With respect to the general question of the hiring of outside engineers by public works authorities, Mr. Glidden emphasized that both parties have definite responsibilities in the public interest, for "there is a right way and a wrong way."

Speaking of the wrong way for engineers, he said, "it is nauseating and a source of much disillusionment to observe, when a public works job is in the offing, how some members of our noble profession attempt to brow-beat public officials, resort to newspaper propaganda, invoke political influence and infest public engineering offices with a persistence approaching the obscene in order to secure a professional engagement. This condition is by no means general, but it happens all too frequently."

The public works official on his part adopts the wrong way when he tries to avoid such pressures and escape criticism by advertising for bids for the furnishing of engineering services, the new ASCE president stated. "Knowingly or unknowingly, he is deceiving his constituents that he is acting truly in the public interest," Mr. Glidden declared. For, as he explained, since professional services are not amenable to detailed specifications, there is no way the amount and quality of professional services to be rendered can be compared.

"It is bad business to award an engineering contract at a figure so low that the engineer may not be able to afford to produce satisfactory work. There may be waste covering several times the amount of the engineer's fee, or the construction may be shoddy or even dangerously unsafe. . . . Cheap engineering is expensive, and to employ it is stupid."

"The conscientious and prudent public official," the ASCE leader said, "is likely to discuss an important project with one or more engineering firms before making a final selection. A final selection should be based on such considerations as prior experience and magnitude of work similar to that in hand, qualifications and experience of the principals of the firm and the key men proposed to handle the work, demonstrated accuracy in determining construction costs, availability considering sufficiency of personnel and work already current with the firm, standing of the firm with investment houses and bankers, and finally estimated cost of the professional service to be rendered."

Noting that competition among engineers has been active and in most cases healthy and proper, Mr. Glidden said, "ASCE is not against such competition. It is against the unprofessional practice, admittedly rare, of competition solely on price basis."

Professional matters get new emphasis

ASCE convention spotlights salary study and recognition by certification; non-technical papers to be published

"Engineering Citizenship"—Professional as distinguished from technical activities—took a step forward in recognition by the American Society of Civil Engineers at its annual convention in New York last week, when the society's Board of Direction approved the formal publication of papers presented in sessions of the year-old Committee on Conditions of Practice.

This committee supervises the activities of a number of professional and administrative committees (e.g. local sections, employment conditions, student chapters), and has been sponsoring program sessions at conventions during the past year. Papers presented at these sessions now take their place alongside technical division papers, historically the mainstay of ASCE publications in the proceedings of the society.

Professional topics, however, have been developed from time to time in the technical divisions, and one of the professional developments occurred in the Sanitary Engineering Division as plans for sanitary-engineer certification, introduced in 1952, came closer to fruition.

Technical, professional and business sessions of the society ran through four days, Oct. 18-21, attracting nearly 2,000 and reaching a peak on the 20th, when new officers and directors, headed by William Roy Glidden, president, took office at the annual business meeting. The society's annual prizes also were awarded at this session, after which Shortridge Hardesty, Robert J. Cummins and Edward P. Lupfer received honorary memberships (ENR Oct. 21, p. 24).

Before relinquishing the gavel, outgoing President Daniel V. Terrell reported that the society's budget is up $145,000 to a record-breaking $1,204,000, thanks to the dues increase.

A large amount of the increase goes back to the local level. Rebates to local sections are to be doubled,

(Continued on page 16)

ASCE CONVENTION delegates this year participated in a program which put . . .

. . . Accent on professional matters

and special rebates are provided to encourage establishment of branches and to aid in the activities of student chapters.

• **Salary levels**—High point in a program devoted to employer-employe relations was a report by William J. Carroll outlining an enterprising salary study by the society's Los Angeles Junior Forum, in which the young civils set out to determine the relative economic position of the civil engineer. Comparing their data with those of medical doctors and four building trades they found that the engineers are worse than the tradesmen but better than the doctors in the first ten years. In the long run civil engineers' cumulative earnings are better than laborers' and carpenters'; about the same as plasterers' and electricians'; and nowhere near as high as those of doctors.

Capping their study with recommendations, the Los Angeles juniors urge the following on the national society:

• Sponsorship of collective bargaining groups by ASCE; also other economic aids to the membership, such as beneficial fee revision, increased publicity. Such activities would involve surrender of certain tax-free status of ASCE, necessitating a $15 dues increase, but the Los Angeles juniors feel that such an excursion into economic betterment would be worth much more to the society's membership.

• A re-evaluation of the fee curves, looking toward higher proportionate return for engineering services and ability to pay better salaries to engineer employes. Such pay increases in consultant's organizations would tend to raise the salary scales in public agencies and, in turn, the engineer's relative economic position.

• Paid staffs for the society's local sections. Such staffs would help put into effect the recommended ASCE activity in collective bargaining, fees and publicity.

Interest of the society's younger men in collective bargaining also was evident at a half-day student conference. E. L. Chandler, ASCE assistant secretary, reviewed the history of unionism in engineering and told of recent developments and sentiments among engineers. Mr. Chandler's talk was followed by an hour-long question and answer period, widely participated in by the 135 students present.

• **Highway engineer shortage**—One of the major topics of discussion, both in formal sessions and in the corridors, was the President's proposed $50-billion, 10-year highway program. The possibility of a shortage of highway engineers being an obstacle was noted in a luncheon address by Francis du Pont, chief of the Bureau of Public Roads.

Mr. du Pont suggested that the most likely solution to the shortage lay in a more professional use of younger engineers. "I've visited a number of drafting rooms, and conclude that a great deal of civil engineering talent is wasted. Highway engineering organizations should consider taking men out of trade schools for drafting and field layout," he said.

Actually, from informal discussions of the problem, it was learned that a few consulting engineer firms are already making use of non-engineering technical skill. One consultant, for example, reported using high school girls for various computing operations and high school draftsmen—after a six-month indoctrination course—to replace a sizable number of his engineer draftsmen, even on such jobs as structural detailing.

• Professional recognition

Tackling a five-session program again this year, the sanitary engineering division reflected the new ASCE policy by stressing matters of professional interest along with the technical.

Prof. Earnest Boyce, University of Michigan, reported the activities of the Joint Committee for Advancement of Sanitary Engineering. His report was the background for a forum that followed on the question of certifying sanitary engineers as a means of improving their status.

It was generally agreed by forum participants that certification—approved in policy by the ASCE Board of Directors in 1952—could be a good thing for this branch of the profession, and it was brought out by discussion that real progress toward that end is being made.

Proposed certification machinery would be patterned after that of the American Board of Preventive Medicine. The Joint Committee for Advancement of Sanitary Engineering would be incorporated to become the necessary legal entity. Legal and financial details of administering certification are being worked out in hopes of having a package to present to ASCE's Board of Directors for approval at its February meeting.

By-laws being drawn will list qualifications and requirements for certification, and probably will include a "grandfather clause" for certifying qualified practitioners with 15 or more years in the field.

Sanitary division spokesmen made clear their hope that engineers' Joint Council eventually might take over the certification function as the umbrella organization most fully representing all engineers in the U. S.

Warren McCabe, chairman of the new EJC Committee on Recognition of Specialties in Engineering took the floor simply to acknowledge that EJC, through his committee, is taking interest in the general subject.

• Professional responsibilities

Another discussion of a professional matter was a lively, unrehearsed forum on sanitary engineers in industrial waste practice. Very frank dis-

cussion, with audience participation, aired questions of competency and professional ethics, with examples.

In the structural and construction divisions, too, emphasis was placed on professional responsibilities of civil engineers.

At the conclusion of a paper reporting results of investigations of structural failures, Jacob Feld, consulting engineer, New York City, urged that a committee be set up with ASCE to report on failures as they occur and to build up a pool of knowledge on the causes and how to avoid similar troubles in the future. Subsequent discussion outlined some of the obstacles that might hamper such a committee, but the concensus was that the objectives would be in the best interests of the profession and the proposal should be submitted to the executive committees of the divisions.

● Technical advances

• **Sanitary**—One of the most significant technical papers before the convention was a report by Prof. Harold B. Gotaas, University of California. He disclosed that practical experiments conducted at the university's Sanitary Engineering Research Laboratory have resulted in establishment of design and engineering criteria for the treatment of sewage by photosynthesis (absorption of solar energy by algae with simultaneous release of oxygen necessary for destruction of organic matter).

The technical feasibility of photosynthetic sewage treatment may be considered an accomplished fact, according to Gotaas. Oxidation ponds employing photosynthesis can be designed much smaller than conventional lagoons that depend upon surface aeration for production of oxygen.

With their design criteria correctly applied, Gotaas and his coworker, William J. Oswald, hold that photosynthetic oxygenation may result in sewage treatment equivalent to good secondary treatment obtained by other methods.

Though the treatment process is significant enough in itself, production of algae may overshadow its importance if a practical harvesting method is devised in the course of continued research. The total annual algae yield at the California pilot plant was 30 tons of the nutrition-packed plant material per acre. The units were derived in order to show the yield as compared with the average field crop yield in the state of less than 1.5 tons per acre per year.

• **Structural**—Frederick S. Merritt, Associate Editor, ENGINEERING NEWS-RECORD, in analyzing the trend to thin exterior walls for skyscrapers, pointed out how lack of clear-cut uniform requirements in building codes was hampering use of new materials and adding unnecessarily to construction costs. He said that engineers would provide a valuable service to their clients and the general public if they would play an active role in updating their local building codes.

The Structural Division also heard: Prof. William Munse, University of Illinois, report test results on connections made with high-tensile steel bolts, which indicated that the higher the tension in the bolts the better the behavior of the joints; LaMotte Grover, Air Reduction, New York City, say that for welding, steel made under American Society for Testing Materials Specification A131 (steel for ships) is a better buy than A373 steel (structural steel for welding); and J. C. Rundlett, Massachusetts Department of Public Works, Boston, summarize present prestressing practice in bridge building and verify an ENR report of a trend to pretensioning (ENR Sept. 2, p. 144, and Oct. 7, p. 199). Also Mr. Rundlett said a survey he had made showed that as of Aug. 1 state highway departments had constructed, or under contract, 200 prestressed bridges, double the total as of July, 1953.

• **Dredging**—With ocean vessel development tending toward deeper drafts, dredging of port channels takes on added significance. Col. B. Talley, North Atlantic Division Engineer, Corps of Engineers said maximum probable drafts were becoming well enough established that a criterion of making channel depths conform to the kind of traffic using a port could now be adopted with confidence. Ports where large passenger vessels call need 45-ft. channels. Medium-sized passenger vessels require 36-ft channels, general cargo freighters 35 ft, and tankers 40 ft. The presence of rock may require a foot or two extra over these figures, as well heavy wave action at harbor entrances.

In speaking of dredging practices, Jacob H. Douma of the Chief of Engineers Office said that the substantial annual volume and cost of the work (several hundred million yards and perhaps $65 million by both public and private agencies) warranted the best engineering and construction possible. Costs are unnecessarily increased, he said, by not confining spoil areas and thus permitting dredged material to flow back into the dredged channel.

• **Soil mechanics**—Of the four sessions of the soil Mechanics and Foundation Division, three were devoted to earthdam technology and one to grouting practices. As earthdams become larger, greater quantities of excavation are required in the foundation and spillway areas, producing material that economy dictates should be used in the dam if at all possible. Ways to use such structural excavation was one subject treated. Dam stability and sheering strength also become of greater moment, so pore pressures and how to reduce them were the focus of other major attention. And a third subject was the all-important one of seepage, particularly comparisons of analytical and observed results. Both cement and chemical grouting were discussed in a series of papers.

How prestressed concrete fared in fire

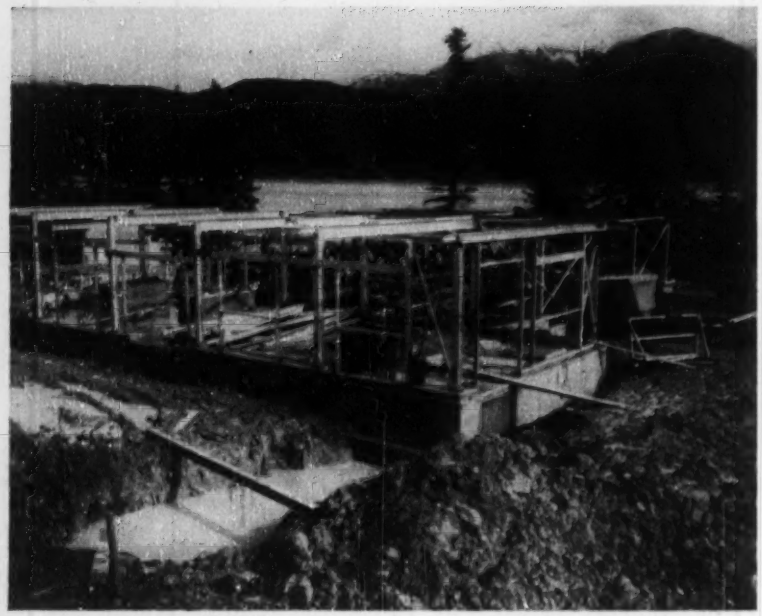
Engineers long have wondered what would happen to a prestressed concrete structure in a fire. Would the high-strength steel be damaged and release the prestress? One answer was given last week by John C. Rundlett, bridge engineer, Massachusetts Department of Public Works.

Mr. Rundlett told an ENR editor at the ASCE annual meeting that the Storey Ave. bridge on the Newburyport Turnpike had been exposed accidently to a severe fire May 27, before the structure was completed. Tests to determine the extent of damage have been under way since.

The bridge has two 58-ft spans, with a total of 36 beams prestressed with grouted-in, end-anchored high-strength steel bars (ENR Mar. 18, p. 38). These bars had a concrete cover of at least 2½ in. At the time of the fire, the roadway slabs had been opened to traffic, while the center separation strip had been formed but not concreted.

The contractor had stored 300 bales of mulching hay under the center strip. The fire started in this hay, and firemen answering an alarm at 4:45 a.m. found it burning fiercely with the center opening acting as a flue. They estimated the fire probably had been burning strongly for 30 min.

The only damage observed was spalling of the pier and the faces of the prestressed beams in the center strip where heat was concentrated. Subsequent load tests up to double the live load on the damaged beams indicated no damage to the tendons, insignificant damage to the concrete and deflections well within calculated limits, Rundlett said.



ALASKA MILITARY PIPELINE starts here at Haines where terminal construction will continue this winter. Completion is set for next year on this . . .

New $29-million link in U.S. defenses

Two pipeline crews have just finished welding 620 mi of steel pipeline across rugged arctic terrain in less than six months. The fuel line from the port of Haines in southeastern Alaska to Fairbanks in the interior will supply the major jet, aviation and diesel fuel needs of the military in Alaska.

In addition to the pipeline, the $29-million project includes construction of a petroleum dock at Haines and pumping stations, storage facilities, housing and other installations.

The pipeline is complete along its entire length except for some stream and road crossings. It will be tied in completely early next summer and turned over to the military in September 1955.

Construction, under supervision of the Corps of Engineers, was carried out by a Canadian-American combine which included Williams Brothers of Tulsa, Okla., McLaughlin Construction Co., Great Falls, Mont., Marwell Construction Co., Vancouver, B. C.

Clearing operations along the route of the pipeline started in the middle of last winter. On April 19, the arc was struck to a welding electrode for the first welded joint at the pipeline's northern end on the outskirts of Fairbanks. A few days later another crew began work on the Canadian side of the border, some 300 mi southeast of Fairbanks.

The Alaskan crew reached its tie-in point at the Canadian border on Sept. 19. The Canadian crew worked along the general route of the Alaska highway to its junction with the Haines highway and then along the general route of the Haines highway to the coast. It completed its work last week.

The pipeline crews worked 9, 10 and 12-hr shifts, six and seven days a week, often under difficult construction conditions. They learned that heavy equipment and the long hours of sunlight can quickly turn an apparently dry area into a swamp where equipment bogs down—sometimes sinks completely from sight.

Williams Brothers technicians fabricated in their shops a ditching machine of special design that was used to dig a trench for pipeline burial. Previous arctic construction experience had indicated that a ditching machine could not do that job.

The pipeline will make up the overland portion of a new petroleum supply line to Army and Air Force bases in Alaska. A continual flow of vital fuels will be fed into the pipeline's terminal facilities at Haines by oil barges reaching Alaska from the U.S. over the protected water route, the inside passage.

Lt. Col. John E. England was resident engineer for the project. The job recently was inspected by Col. Louis H. Foote, North Pacific Division Engineer and Col. Carl Y. Farrell, Alaska Division Engineer together with Brigadier H. W. Love, commander of the Canadian Army Northwest Highway System.

Chicago filter plant

Supreme Court removes last legal hurdle blocking construction of project

The United States Supreme Court last week cleared the way for Chicago to go ahead with construction of an $85-million water filtration plant to serve more than 3 million people.

A circuit court granted an injunction to stop construction of the plant in August 1953 (ENR Sept. 3, 1953, p. 23). The Illinois Supreme Court reversed that decision last May 24 (ENR June 3, p. 23) and held that the city could proceed with construction of its Central District Filtration Plant, just north of Navy Pier.

The U.S. Supreme Court, in refusing to review the decision of the Illinois Supreme Court, apparently ended litigation seeking to prevent construction of the 960 mgd plant on a 61-acre site of reclaimed land, or made-fill, in Lake Michigan.

There was only one additional possibility for further delay. The group of property owners in the vicinity of the plant who secured the original injunction had 10 days in which to seek a rehearing of the U.S. Supreme Court's decision. That was considered unlikely to happen.

• **One season lost**—These legal difficulties already have set the construction program back at least one full season. At the time work was halted, a $6.6-million contract for a sand, clay and rockfill cofferdam enclosing the site was about one-third complete. The Great Lakes Dredge and Dock Co., contractor for the job, had one short segment built up to above lake level.

Work on the cofferdam was resumed last July 26 after the state supreme court's reversal of the injunction granted by the circuit court. It is now 55% finished, and the target date for its completion and for dewatering of the enclosed area is August 1955.

The next major step will be to readvertise and take bids for about 6 mi of large dia tunnels. These tunnels will connect the new filtration plant with the city's distribution system and with an existing intake in Lake Michigan.

The city took bids on this work about a year ago, but contracts were not awarded because of the legal obstructions in the way of the project at that time. Most bids submitted a year ago were around $15 million. No decision has been made yet on readvertising the tunnel work, but indications are that the city will take bids on it within a few weeks so that construction can start early next spring.

Washington talks up big public works program

Construction must increase to about $20 billion annually, say officials who predict period of rapid national growth

Key Administration officials in Washington are charting the biggest public works construction program in U.S. history. President Eisenhower's advisers are talking about boosting total spending on public works by $10 billion to $12 billion a year—more than double the current program.

Eventually, they say, public works spending by federal, state and local governments might climb to as much as $30 billion a year. They believe construction on something like this scale is essential to the welfare of the nation.

There's no question of rushing to the aid of a faltering national economy with an emergency injection of public works construction money. That was the idea behind the New Deal program of the 1930s when the Roosevelt Administration spent something like $3 billion a year for public works.

The thinking of the planners of this new program represents an entirely new concept of public works spending. President Eisenhower's advisers believe the nation's economy is on its way to a new round of growth. In fact, they see the country as already bursting at the seams—too big for its highway system, too big for its schools and hospitals and falling behind in improvement and expansion of basic public services like water and sewerage systems.

One of them put it this way: "Here's a public works program for the sake of the public—not for the sake of the works."

• **First, highways**—The President's $50-billion highway plan—scheduled to go to Congress early next year—is the pilot project. If details for a highway construction program acceptable to Congress can be worked out, other construction programs are expected to follow.

The development of the highway plan is typical of what is happening to public works thinking. Six months ago, no responsible public official even talked about a highway program of that size. But the $50-billion target is accepted without question today. Even the strongest foes of spending within the Administration have not objected—at least not publicly.

There's no sign that President Eisenhower's Treasury guardians, like Secretary George Humphrey and Budget Director Rowland Hughes, have bought more than the highway plan. But public works proponents are cheered by the shift in official thinking about public works since the President first proposed the highway idea last summer.

• **Then, schools**—Schools probably will be pushed second to highways. Broad public support for a multi-billion-dollar school construction program is expected to stem from a White House conference on education next year.

A lease-purchase plan—like the one already in effect for post offices and other federal buildings—might be applied to schools. Under this plan, a private builder constructs a federal building and receives annual payment from the government for, say, 20 years, after which the government owns the building. Similar arrangements may be offered local school authorities where districts already are bonded to the limit.

Water and sewerage programs have next priority, as official thinking now shapes up. Estimates of spending for these purposes are figured on the basis of five-year programs, rather than 10-year plans as for highways, schools and hospitals.

The biggest obstacle in the path of these public works construction programs, of course, is the difficulty of financing them. Officials admit construction on anything like the scale now being talked about would mean increasing the national debt. That poses grave problems.

• **Politically,** it means Congress must be sold on the real need for more public works. No matter which party wins next Tuesday's election, that will be no small task.

• **Economically,** it means the program must be geared to the national economy to spur inflation. Eisenhower's No. 1 domestic promise was to halt inflation.

As Administration officials see it, the problem of inflation has two sides. Over the long run, they are not worried. They count on the natural growth of the nation's economy to provide the necessary balance. Even if new debt in the neighborhood of $100 billion were created over the next decade, they believe the total burden of debt might well be less than it is today, in relation to the national income. In short, they expect the country to grow even faster than the debt increase they foresee.

But for the short run, they are aware that any big, debt-creating construction program has inflationary tendencies. They admit there is an element of risk, but they believe it is possible to carry out needed public works construction and still make good President Eisenhower's pledge of a stable dollar.

Partly for this reason, the President's advisers don't want any rigid timetables for spending on public works. They are playing down the idea of 10-year programs. They want to be free to increase or reduce spending as economic conditions warrant.

When the time comes to lay these ideas before a Congress and public who will want to know why a Republican Administration is going in for debt-creating spending, Administration spokesmen will argue that money spent for needed public works is, in large part, at least, capital investment and should be so considered.

They will say that highways, for example, are "productive capital" because they stimulate all sorts of businesses—from frozen custard stands and motels to the big automobile industry. And, by providing more efficient transportation, they will help cut costs for many other industries.

The Administration will argue that you shouldn't expect to build highways from current tax receipts. They will say highways are not current expenses, like munitions, but capital investments. As such they should be written off so much a year just like private industry writes off the cost of a new factory.

To support this line, government experts have cast up figures to show how much better highways will add to public revenues. The additional revenue is expected to come chiefly from the gasoline tax, ton-mile taxes on trucks and license fees. If the President's road plan is carried out, these experts estimate public revenues will increase by $300 million a year.

The breakdown

It's all still in the talking stage, but here's how estimates are shaping up for needed federal, state and local government spending on public works each year:

	Current spending	What's needed
	(in billions)	
Highways	$5.0	$10.0
Schools, colleges	2.5	6.7
Hospitals	.6	1.5
Water and sewerage	1.1	3.0
Total	$9.2	$21.2

Ohio River Valley

Division Engineer credits flood control works with preventing great damage

Flood control works built by the Corps of Engineers may have prevented $120.8 million of damage in the Ohio River Valley within the last few days.

Col. J. L. Person, Ohio River Division Engineer, told the 60th anniversary meeting of the Ohio Valley Improvement Assn. that flood control works installed since 1937 on the upper reaches of the Ohio River and on the Allegheny and Monogahela Rivers had effectively held back a flood which would have ranked with the worst in history.

These control works, he said, had succeeded in reducing the crest of last week's flood at Pittsburgh by 8.6 ft and at Wheeling, W. Va., by 9 ft. The reservoirs that accomplished this cost $115 million, Col. Person said.

Col. Person also pointed out that the industrial plant of the Ohio Valley has grown by more than $5 billion since the end of the war, partly because of the availability of water for industrial use and of year-around water transportation. He said the Ohio River now is carrying about 25% more tonnage than will the St. Lawrence Seaway when that project is completed.

Maj. Gen. Samuel D. Sturgis, Chief of Army Engineers, and W. A. Willig, vice president of the port of Louisville, Ky., were among the other speakers who addressed the meeting. Gen. Sturgis stressed the need for 21 modern locks and dams on the Ohio River to replace the 46 outmoded structures now in use. Willig cited the need for more rail and truck facilities along the river and its tributaries.

National Safety Council names construction men

The National Safety Council elected George P. O'Rouke, of the O'Rouke Construction Co. in Dallas, Tex., general chairman of its construction section at its annual meeting in Chicago last week.

O'Rouke succeeds H. B. Alexander, president of H. B. Alexander & Son, Inc., Harrisburg, Pa., who has held the post for the past two years.

Elected vice chairman at the meeting, which was held in conjunction with the 42nd National Safety Congress, was Robert L. Jenkins, Chief of the Safety Division, Corps of Engineers, Washington, D. C.

William G. Hawkins, insurance manager and safety director, Winston Brothers Co., was named secretary of the section to succeed J. George Robinson, manager of Associated General Contractors of Missouri.

J. G. McFarland, safety engineer of the American Bridge Division, U. S. Steel Corp., was named chairman of the program committee for the next year. He succeeds O. Lupinski, of Lupinski, Inc., Milwaukee.

The Associated General Contractors of America was one of eleven trade associations to receive an annual award for outstanding work in promoting safety.

Michigan expects to spend $149.8 million on highways

Michigan will spend $149.8 million on 328 state highway projects during the next two years, State Highway Commissioner Charles M. Ziegler has announced.

Among the larger projects included in the program are a $3.5 million grade separation on the Edsel Ford Expressway, a $2.2 million grading, drainage and paving job on the John C. Lodge Expressway and a $2 million grade separation with grading, drainage and paving on the Lodge Expressway.

Of the total of 328 projects, 38 are bridge construction jobs and 290 are strictly highway work. Of the highway projects, 122 are not more than 5 mi long.

Association plans to seek new Columbia power agency

The Northwest Public Power Assn. is drawing up plans for the creation of a Columbia River Development Corp. to plan, build and manage power generating facilities in the Columbia River Basin.

The new corporation would be the successor to the Bonneville Power Administration. It would be headed by a full-time, five-man board of directors appointed by the President with the consent of the Senate. The association expects that a bill setting up the new organization will be submitted to Congress in January.

Association plans call for existing portions of the federal Columbia River power system—including Bonneville and Grand Coulee Dams—to be turned over to the new corporation upon direction of the President. The new corporation would finance projects with 50-year electric revenue bonds to be purchased for the first five years by the U. S. Treasury, then marketed commercially with the Treasury buying any unsold issues.

Air Force Academy

Preliminary planning gets under way on project—construction next spring

Preliminary planning is getting under way rapidly so that construction may start next spring on the $126-million Air Force Academy near Colorado Springs, Colo.

The Air Force has set up the Air Force Academy Construction Agency to supervise and monitor the planning, design and construction of the academy. This agency now has offices operating both in Washington, D. C., and in Colorado Springs, but it will consolidate its operations in Colorado Springs before the end of the year.

The agency now is monitoring the development of zoning around the academy site, supervising a topographic survey of the area and working with the Colorado State Land Acquisition Commission on real estate purchases.

Skidmore, Owings and Merrill, architect-engineers for the job, also have offices both in Washington and in Colorado Springs and are working on a master plan for the site. Design standards are being firmed up, and a phased construction program is being developed.

Initial construction of roads, basic utilities and runway facilities is planned to begin in the late spring. Plans for handling construction are still in the formative stage, but after Jan. 1 contractors may write to the Air Force Construction Agency, P. O. Box 1670, Colorado Springs, Colo., for information on invitations to bid.

In order to begin cadet training as soon as possible, the Air Force will modify facilities at Lowry Air Force Base, outside Denver, to accommodate the first class of cadets by July 1, 1955. This work—totaling about $1-million—will be placed under contract before the end of this year by the Lowry Air Force Base purchasing and contracting officer.

Director of the Air Force Construction Agency is Col. L. J. Erler, who was director of installations for the Far East Air Forces in Tokyo, Japan, from 1949 to 1952 and has since been serving in Washington as director of all Air Force construction throughout the world.

John P. Huebsch is deputy director of the agency, and Col. Albert E. Stoltz, an Air Force officer with years of construction experience, is assistant to the director. Col. Stoltz has been mentioned prominently to succeed Col. Erler when the present director retires from active duty Nov. 30.

Toronto disaster

Damage from hurricane and floods will amount to about $100 million

Hurricane and flood damage in the Toronto, Canada, metropolitan area was estimated this week at $100 million. A total of 62 persons were killed in the twin disasters.

A tremendous flash flood on the Humber River was responsible for a major part of the damage. The river rose 20 ft to 30 ft in the space of a few minutes and roared through the city, carrying away bridges, homes and other structures.

Authorities estimated that the 8-in. rainfall in the area cascaded 322,000,000 tons of water over the 377,600 acres of watershed in the Toronto area. Some 40 bridges were swept away. Evidence indicates some of those bridges contributed to the violence of the flood by holding back the head of water for a short time and so allowing time for a still bigger head to collect.

Only one of the 13 approaches to the city from the west was still open after the storms. Traffic was strictly regulated while Bailey bridges supplied by the Ontario Hydro-Electric Power Commission and the Canadian Army were put into place. The larger bridges are expected to be open only to regulated traffic until new bridges can be built.

Whole blocks of homes along the Humber River in Toronto and its suburbs were destroyed with great loss of life. Municipal officials now are expected to forbid the construction of new homes along the low-lying river front and to convert the entire area into parks.

Werden Leavens, chairman of the Humber Valley Conservation Authority, announced that he will bring up for reconsideration plans for building three dams on the upper Humber River. Plans to build the dams were abandoned in 1952 when Toronto and York Township authorities refused to make the required financial contributions.

The Canadian government has named John B. Carswell, Toronto engineer, and Bruce Shaw, Toronto economist, to investigate the extent of the damage. Both men were members of a similar commission to assess damage of 1950 floods in Winnipeg.

The Canadian government's assistance for the repair or replacement of homes, roads, bridges and dikes will be based upon the findings of the two.

Concrete drydock is seaworthy craft

Tugs move the Navy's $4-million floating concrete drydock to shipyard in Seattle, Wash., for fittings. The 400-ft drydock is the largest of its kind ever built in this country. The structure contains 5,400 cu yds of concrete, and 2,000 tons of steel. It weighs 12,800 tons and will have lifting capacity of 4,000 tons. It will be equipped with its own power system and will be capable of ocean trips. The drydock was designed by DiStasio and Van Buren, New York consulting engineers, under supervision of the Navy's Bureau of Yards and Docks.

It was built by General Construction Co. (ENR Sept. 16, p. 40).

Jobs in the news

SEWAGE WORKS—J. Rich Steers, Inc., New York, was low bidder at $12.5 million for construction of the extension of Bowery Bay sewage treatment works.

ST. LAWRENCE SEAWAY—A contract for the first construction to be undertaken on the Canadian section of the St. Lawrence Seaway has been awarded to McNamara Construction Co., Ltd., and Peacock McQuigge, Ltd., both of Toronto, and Pigott Construction Co., Ltd., Hamilton. The contract is for deep dredging in Montreal harbor (ENR Oct. 14, p. 25). Amount is $2.3 million.

GENERATING PLANT—Oklahoma Gas & Electric Co., Oklahoma City, will construct a steam generating plant near Muskogee, Okla. Estimated cost is $20 million. Pioneer Service & Engineering Co., Chicago, is consulting engineer.

OFFICE BUILDING—Preliminary work will start in December on Proctor & Gamble's new $5-million, 11-story office building in downtown Cincinnati. The structure, which will contain 320,000 sq ft of office space, is scheduled for completion in 1956. Significant features include modular design, the first major escalator system in a Cincinnati office building and provision for the later installation of a rooftop landing area for helicopters. Frank A. Messer & Son, Cincinnati, is contractor; A. M. Kinney, Inc., Cincinnati, is consulting engineer; and Voorhees, Walker, Foley and Smith, New York City, are architects and engineers.

HOSPITAL—Corps of Engineers, Galveston, has awarded a contract to Farnsworth & Chambers Co., Inc., Houston, for the construction of a hospital at Lackland Air Force Base, Texas. Estimated cost is $6.5 million.

TVA reports $390 million of dam and power projects

The Tennessee Valley Authority, in its financial statement covering fiscal 1954, estimates cost of completing the major dam and power projects under construction or authorized at $390 million.

This includes $128 million in materials and services contracted for and not delivered as of June 30 and $11 million in additional contractual commitments on which TVA's obligation is limited by availability of funds from appropriations for succeeding years.

Pump

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This Yeomans 3-inch Vertical Bilge Pump was installed in 1907 and has given reliable service all these years without any major repairs . . . but it did finally begin to show signs of wear. Management knew of the special reconditioning facilities of Yeomans and feeling there was life in the old pump yet . . . returned it for overhaul.

Management was right! In the special service shop at Yeomans (where a pump is never too old to have parts replacements) this Bilge Pump was taken apart, inspected, cleaned, and reassembled with a new impeller, shaft, top bearing, suction plate and discharge pipe. It looked like new with its new paint job . . . and it is performing that way on the job.

Had this pump been a few years younger, it could have received still another modernization treatment in the Yeomans reconditioning shop . . . LUBRI-VAC(R) could have been added to make it even better than ever.

LUBRI-VAC is the most important development in Vertical Wet Pit Pumps since their introduction. It is a system of lubrication, developed by Yeomans, that keeps the main bearing properly lubricated at all times. Field data on hundreds of pump installations prove conclusively that LUBRI-VAC has reduced bearing failure by an impressive 95 percent!

Learn more about this development. *LUBRI-VAC can be incorporated into many Yeomans Wet Pit Centrifugal Pumps now in use!* Consult factory for further information. System is described in Bulletin 3-8G01.

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CITY BY CITY

Change of plans

Toronto—After revising its east-west express highway project a number of times in recent months, Toronto has settled on a $65-million route compiled from six different plans and is set to start work on three sections to cost $30 million.

The three sections recommended for an immediate start only take care of the eastern and western ends of the six-lane project. To provide a route along the central part of the Lake Ontario shore, the new roads will for the time being connect with the existing Fleet St. highway. Eventually, the expressway will form a bypass route encircling the city by connecting with northern bypass express roads now under construction (ENR July 15, p. 44).

This is the work that is scheduled to get under way at once: (1) extension of Queen St. west from Roncesvalles Ave. over the Humber River to the Queensway; (2) construction of an expressway from the Humber River inland from Lake Ontario along the right-of-way of the Ontario Hydro Electric Power Commission to Dowling Ave.; a new Humber River bridge north of the existing one; (3) paving of Keating St. to Woodbine Ave. and widening Woodbine Ave. to 46 ft.

The revised plan calls for taking all streetcars off the new expressway and placing them on the proposed extension of Queen St. West. It also provides for setting up permanent fringe parking facilities on the east bank of the Humber River.

Seaside slum

New York City—One of New York City's "resort area"—slums—in the Seaside section of Rockaway Beach, Borough of Queens—will be weeded out if a $23-million Title I slum clearance project wins approval.

A report by the city's committee on slum clearance proposes a new residential development fronting the Atlantic Ocean beach and involving some 17 city blocks. Twenty 8-story apartment houses would provide 1,500 dwelling units for year-around residents. Buildings themselves would cover only 14.6% of the area—the rest would be used for parks and children's playgrounds. A shopping center, a parking area for 1,000 cars, and garages for another 300 cars are also part of the plan.

The project site now consists of frame buildings that are largely deteriorated and seasonally used for small hotels, rooming houses and mass blocks of summer cottages. Of the present 749 dwelling units in the locality, only 142 (19%) are occupied throughout the entire year.

Progress report

Eugene, Ore.—In the face of opposition from sports, fishing and tourist partisans of the McKenzie River Valley, the Eugene Water & Electric Board is going ahead with hydroelectric plans for that stream. It has assigned engineering work on the $7-million Beaver Marsh project to the Corvallis (Ore.) firm of Cornell, Howland, Hayes & Merryfield.

It was after its proposal for a partnership development of Cougar Dam became a casualty in the last Congress that the utility applied to the Federal Power Commission for the Beaver Marsh construction permit (ENR Sept. 16, p. 26). Under preliminary plans, the project will add 30,000 kw to the present hydroelectric system on the McKenzie.

The development calls for two dams —one 50 ft high and 800 ft long, and the other 7 ft high and 80 ft long. The low dam will divert water from Clear Lake through an 8,400-ft tunnel to the powerhouse at Beaver Marsh. The higher structure will provide re-regulation to preserve stream flow and recreational values.

Painless parking

Chicago—The Chicago Park District has come up with one more solution to the city's problem of taking the parking strain from the heavily congested Loop district. It has opened up the first of nine multi-story garages in its program to improve parking conditions.

The new garage—a 12-story, $1.7-million project—has a capacity of 495 cars. Its four elevators carry vehicles vertically and horizontally to parking spaces.

Just a few weeks ago an $8-million underground garage beneath Michigan Ave. and Grant Park was opened up by the park district to provide parking for 2,359 cars (ENR Sept. 16, p. 44).

Saved by a storm

Greensboro, N. C.—Until the long arm of Hurricane Hazel hit Greens-

boro, the city was in the midst of its worst water shortage in 15 years. But 6 in. of torrential rainfall accompanying the storm brought an end to the 40-day drought and to emergency rationing that threatened an industrial shutdown.

The rain sent the level of Lake Brandt—the city water supply—back to its normal 850,000,000 gallons. During the shortage it had dwindled to about 300,000,000.

Greensboro—faced with only a few weeks' supply of water—had been busy exploring new sources of supply. It installed emergency civil defense pipelines to import water from High Point municipal lake and Hamilton Lake. Before that, it built an emergency dam in a residential area creek and an emergency lake in a city park.

Tunnel talk

Wheeling, W. Va.—After thinking about the traffic congestion that could follow completion of a new bridge across the Ohio River, the Wheeling Area Conference has suggested a $9-million tunnel to speed east-west motorists through the downtown section of the city.

The New York City engineering firm of Knappen, Tippets, Abbett & McCarthy has been awarded a contract to study the project, which would be built through Wheeling Hill. The North American Construction Corp., a Delaware firm, already is making a preliminary feasibility survey to determine whether the tunnel could pay for itself as a toll facility.

Eye to the future

Norfolk, Va.—Sometime ago Norfolk's Division of Planning decided that commercial helicopter transportation was a fast-developing field and began compiling facts on required landing and take-off facilities. Now the planners are going to start a survey to find possible helicopter sites on the fringes of the downtown business section.

One site already is in mind: city-owned property on the Elizabeth River waterfront, only a short distance from Norfolk's courthouse and banking sections.

City Planning Engineer Donald R. Locke sees Norfolk's initial helicopter service as an aid to airline service, with the first route slated to link the Municipal Airport (which lies in the next county) with the downtown part of the city.

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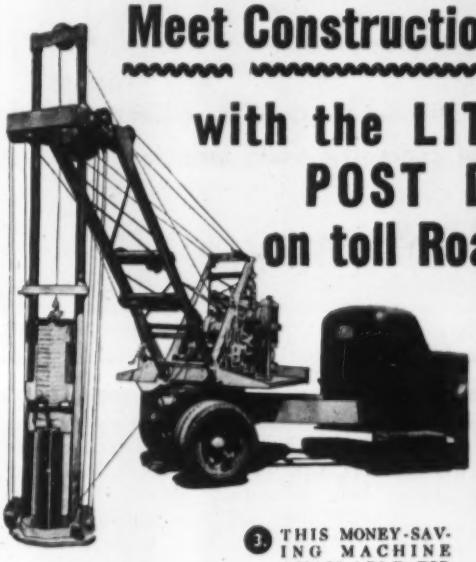

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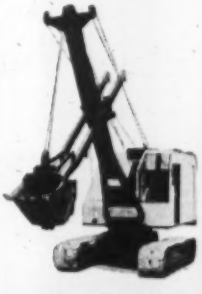

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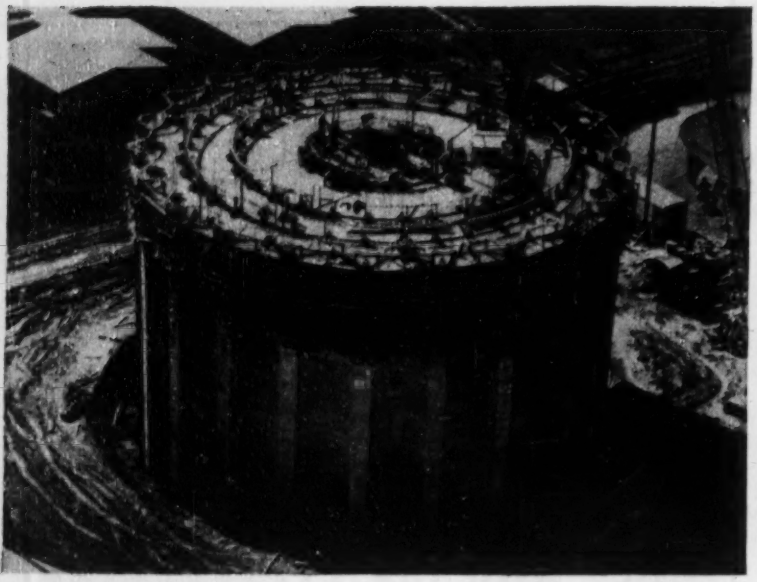
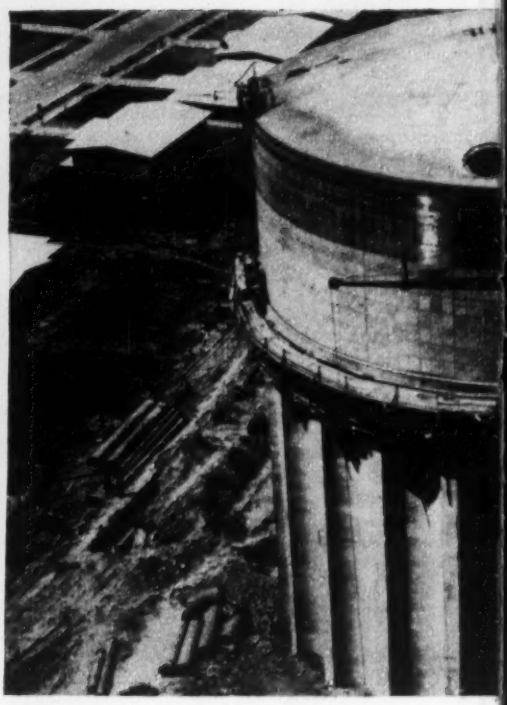


Slip-form construction of concentric walls form tower for . .



Prestressed concrete water tank of

Largest tank of its type

J. J. Closner
Vice-President
The Preload Company, Inc.
New York, N. Y.

Dallas, Tex., recently placed in service a two-million-gallon prestressed concrete tank, elevated 77 ft above grade on a concrete tower.

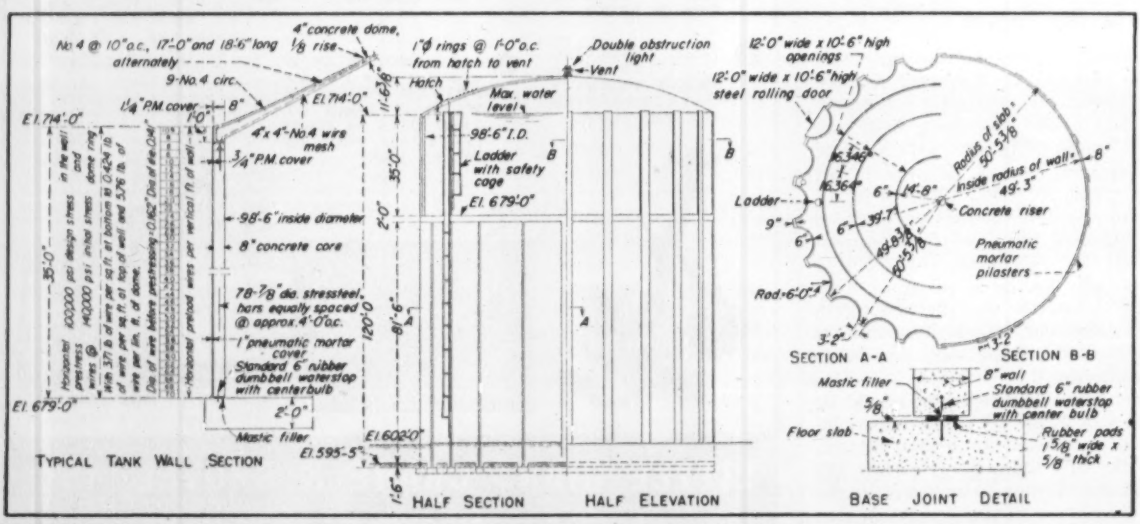
Two things distinguish it:

- It has the largest capacity of any elevated prestressed concrete tank constructed to date.
- It has unusual architectural treatment dictated for appearance by location in a residential area.

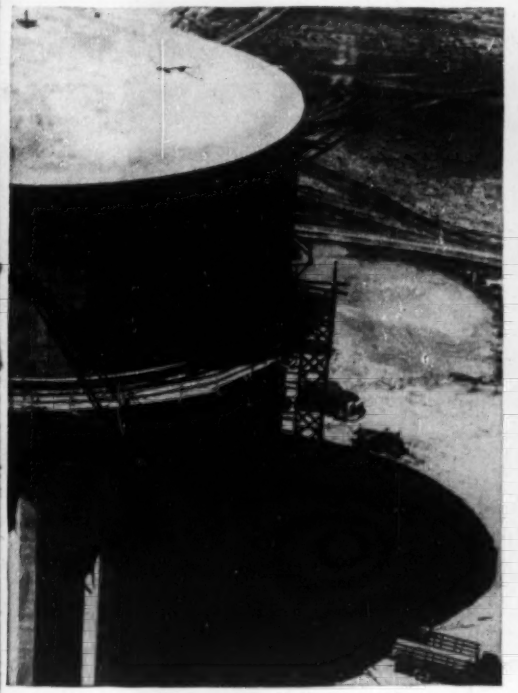
The project was bid a year ago with prestressed concrete and steel in competition under specifications prepared by the Department of Water and Sewers, City of Dallas. Four lump-sum bids submitted ranged $229,600, $246,000, $257,480 and $261,394—with two steel-tank proposals sandwiched between two bids based on prestressed concrete.

The prime contract went to the low bidder, Whittle Construction Co. of Dallas. The structure was designed by The Preload Company, Inc., of New York and Preload Construction Corporation was subcontractor for the prestressing.

General design features appear in the drawing below. The big prestressed concrete tank (98 ft 6 in. ID x 35 ft in height) is supported on a 2-ft thick reinforced concrete slab resting on four concentric ring walls which pass to rock foundations. The exterior ring wall is fluted to give a pilaster effect. Undulations with a 6-ft radius are sepa



DESIGN IS NOVEL—One feature of design new in this tank is base joint detail devised to reduce horizontal restraint.

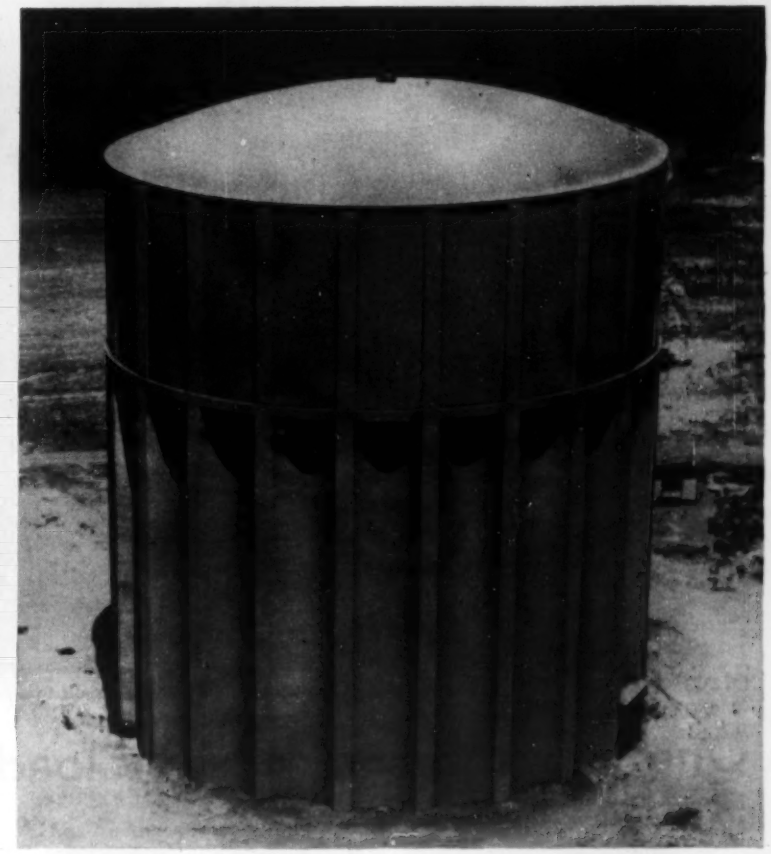


2-mg capacity . . .

rated by 3-ft 2-in. flat vertical surfaces to give the effect. Substructure walls were built simultaneously with slip forms using a system of hydraulic jacks.

• **New joint**—The design included some new features Preload is incorporating in its more recent work.

To reduce the vertical moments caused by restraint at the base of the tank wall, the wall is constructed on two rubber pads, each $1\frac{3}{8}$ in. wide and $\frac{3}{8}$ in. thick. These are placed on each side of a standard 6-in. rubber bulb-type waterstop (see base joint detail in drawing). This construction eliminates variable effect of friction between the wall and the footing when the horizontal prestressing is applied. The restraint caused by the rubber pad is very small and is accurately known from extensive tests conducted by Gates Rubber Company of Denver, Colo., who supply this material. The result is a much more uniform inward movement of the wall under prestressing, and outward movement under filling with water, than was previously possible with sliding type base joints depending upon a lubricant. The new joint detail reduces bending moments and resulting vertical stresses due to restraint at the bottom and top of the wall. It means that with vertical prestressing in the wall and the tank empty the maximum stress due to bending is only 1 psi in tension on the inside face of the wall. With the tank full, the wall is in compression.



Making attractive elevated storage for Dallas, Tex. . . .

At the top of wall, the dome and dome ring rest on another rubber pad 8 in. wide and $\frac{3}{8}$ in. thick which passes completely around the top of the wall. This pad minimizes the effect of bending in the upper portion of the wall caused by the heavy prestressing required on the dome ring to carry the dead and live loads of the dome.

• **Slip-forms go fast**—Hydraulically raised slip-forms erected in 126 hours the 83-ft high water tank substructure. The lifting rate thus averaged 8 in. per hour during which time 11 cu yd of concrete and an average of 1,000 lb of steel were placed.

The 35-ft high tank wall is 8 in. thick. It is prestressed circumferentially by the wire winding method with an initial force of 153 kips per vertical foot at base of wall; decreasing gradually to a force of 1.75 kips per foot at the top of the wall. The dome ring required an initial prestressing force of 238 kips to withstand dome loads.

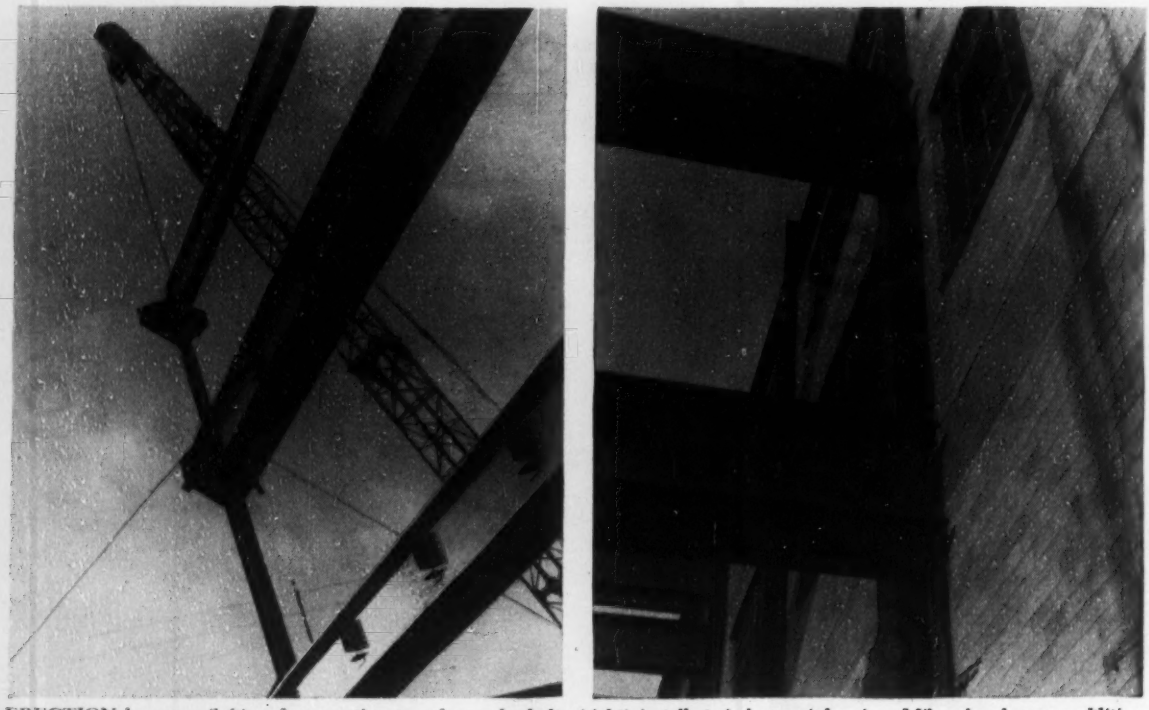
The tank wall is prestressed vertically by 78 Stressteel bars of $\frac{7}{8}$ in. diameter spaced 4 ft on centers. These bars impart 12.8 kips per circumferential foot of wall. The bars are in tubes, and grouted after prestressing.

A 36-ft ID riser for the tank is of concrete pressure pipe, manufactured locally. Access ladder is carried up inside the substructure on one of the interior walls and passes through the tank floor and thence through a concrete tower within the water tank and on to the roof. This eliminates exterior appurtenances.

The City of Dallas arranged to install a 12-ft wide x 10-ft 6-in. high steel rolling door in the exterior wall of the substructure, and openings were left in the three interior walls so that covered storage space of about 7,500 sq ft was made available—at no cost.

On future installations, it is considered that pumping stations and other normally isolated installations of that type can be incorporated right in the protected substructure area.

Karl Hoefle is superintendent of the Dallas Water and Sewer Department; R. E. Morris, Jr. is its Chief Engineer. Lloyd McKanna was the city inspector on the project. L. E. Garner was superintendent for Whittle Construction Company. M. L. Cunningham of Preload Construction Corporation was superintendent for the prestressing.



ERECTION by crane (left) and connection to columns by bolts (right) installs twin-beam girders in a Milwaukee brewery addition.

One way to handle heavy loads on long spans

E. F. Vranich
Structural Engineer
Lefebvre & Wiggins,
Architects-Engineers
Milwaukee, Wis.

Problems of long spans and heavy loads have been solved through the use of high strength bolts and double girders in a bottle-house addition for the Miller Brewing Co. at Milwaukee, Wis.

The construction of the 53-ft wide by 286-ft long, three-story building required 600 tons of heavy structural steel. Fabrication of this steel was accomplished in record time, with emphasis on accuracy and templet matching of large joints. Erection took only four weeks, including bolting, torquing and field touch-up painting.

The building frame consists of reinforced concrete from the basement to the first floor and structural steel from the first floor to the roof. Besides being designed to allow for further expansion of the brewery's bottling and packaging facilities, the building provides for the palletizing of beer for shipment and direct fork truck loading of semi-trailers. This presented a problem in that full flexibility of the first floor for the palletizing operations required clear spans of 52 ft for second floor girders. Second and third floor operations and machinery placement also demanded full clear spans from front to rear.

• **Heavy concentrated loads**—Weights that must be carried on the second and third floors include: Soaking tanks weighing 154,000 lb each, bottle cleaners at 210,000 lb each, automatic pasteurizers at 211,000 lb each, and bottle washers weighing 55,000 lb each, plus auxiliary machinery and numerous conveyor systems.

Designing of the reinforced concrete first floor for live loads of 550 psf was required because of the double-tier palletizing operation planned. The entire slab, beam and girder, as a result, was designed for continuity and required a concrete mix to insure a minimum compressive strength of 4,000 psi.

• **Limited headroom**—All-welded type plate girders were designed by Lefebvre & Wiggins for the span and load requirements. Head room limitations and adjacent floor level matching allowed maximum girder depths of only 42 in., thus resulting in a girder-span to depth-ratio somewhat beyond economical limits. Alternate design of standard rolled sections were presented to fabricators for bidding. Resulting bids and construction schedules precluded choice of the standard rolled sections. Girders varied in size from single 24-in. WF beams at 145 lb per ft, to double-diaphragmed 36-in. WF beams at 280 lb per ft.

The double-girders were diaphragmed by means of 18-in. WF sections spaced equally across the spans, with the end diaphragms held near girder ends to insure true shear action at column connections. Diaphragms were shop fillet welded to the interior face of one girder, with field plug welding to the matching girder. Plug welding in the field was performed upon completion of frame squaring, plumbing and bolt tightening and prior to torque wrenching. To insure full contact between the girder web and diaphragm flange, the girders were clamped in position until all plug welds were completed.

• **Column connections**—Girder reaction posed a special problem for connections at the columns. Wide girder separations, where double-diaphragmed girders were used, resulted in considerable distances between column webs and webs of the double girders.

In conjunction with the fabricator, special angle wing connections were chosen. The look-out angle yielded sufficient clearances and also allowed joint restraint, necessary for lateral support at the joints. Joints were designed for shear and moment.

Wing-angle to column connection was accomplished by two-pass welding with added plug weld area on angle legs adjacent to column fillets.

Fabricators were allowed to bid erection by means of field riveting, rib bolting or high-tensile bolting. Examination of girder to column clearances, however, eliminated the use of rib bolts and rivets at these points.

• **High-tensile bolts favored**—High-tensile bolts proved to be the most positive means of developing full shears and moments imposed at wing angles. Positive clamping action, ease of installation and speed of fitting up and final bolting led the designers to allow use of high-tensile bolts throughout for field erection.

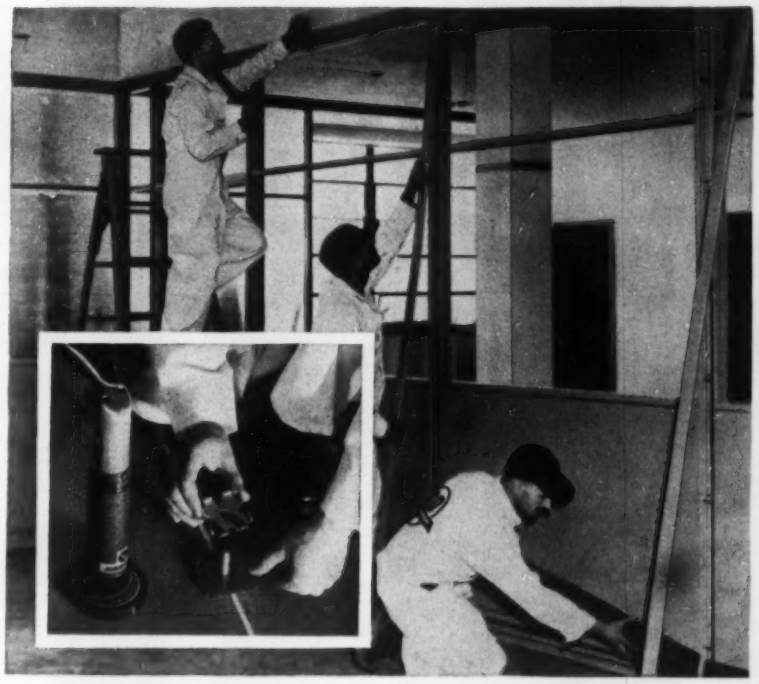
Fit-up bolting was done with high-tensile bolts which, with the full group, were tightened to form final connections. Bolting crews began installation of all bolts in connection groups immediately upon completion of squaring and plumbing. Follow-up crews tightened bolts with pneumatic wrenches to the approximate required torque. Final torquing to the 90% value was accomplished by means of manual dial wrenches with torquing beginning at center groups and progressing successively to top groups, then down through all groups, followed by an upward pass to center groups. The high-tensile bolts were ⅞ in. dia throughout on all main members, thus requiring torque values of 470 ft-lb.

• **Field inspection**—Engineers' specifications were in conformance with AISC high-tensile steel bolt specification. Specifications called for inspection of no less than 10% of the bolts within a group. Inspection was accomplished by match-marking nut and thread, loosening nut and then retorquing to full value and inspection of match mark. In no case were match marks exceeded, thus insuring positive clamping action and strains below bolt yield points.

Inspection operations followed final bolting crews and in no way interfered with erection operations.

Besides designing the entire concrete and steel structure, the architectural-engineering firm of Lefebvre & Wiggins supervised erection and bolting operations. Structural steel was fabricated and erected by the Milwaukee Bridge Co. Inspection of bolting operations was performed by the Kline Inspection Service, of Milwaukee.

The Becker Construction Co. was the general contractor for the concrete base structure, and the Selzer-Ornst Co. for the concrete and masonry superstructure, both of Milwaukee.



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These same advantages of RAMSET speed and economy can be gained for almost any work involving fastening into steel or concrete, for new buildings or modernization. Three RAMSET JOBMASTER tools are available for light, medium or heavy work, with 65 Tru-Set Fasteners in six different types to match the specific job requirements.

If you'd like to know more about how RAMSET saves time, money and trouble, for fastening into steel or concrete, call your local dealer or ask for illustrated manual *Modern Fastening Methods.*

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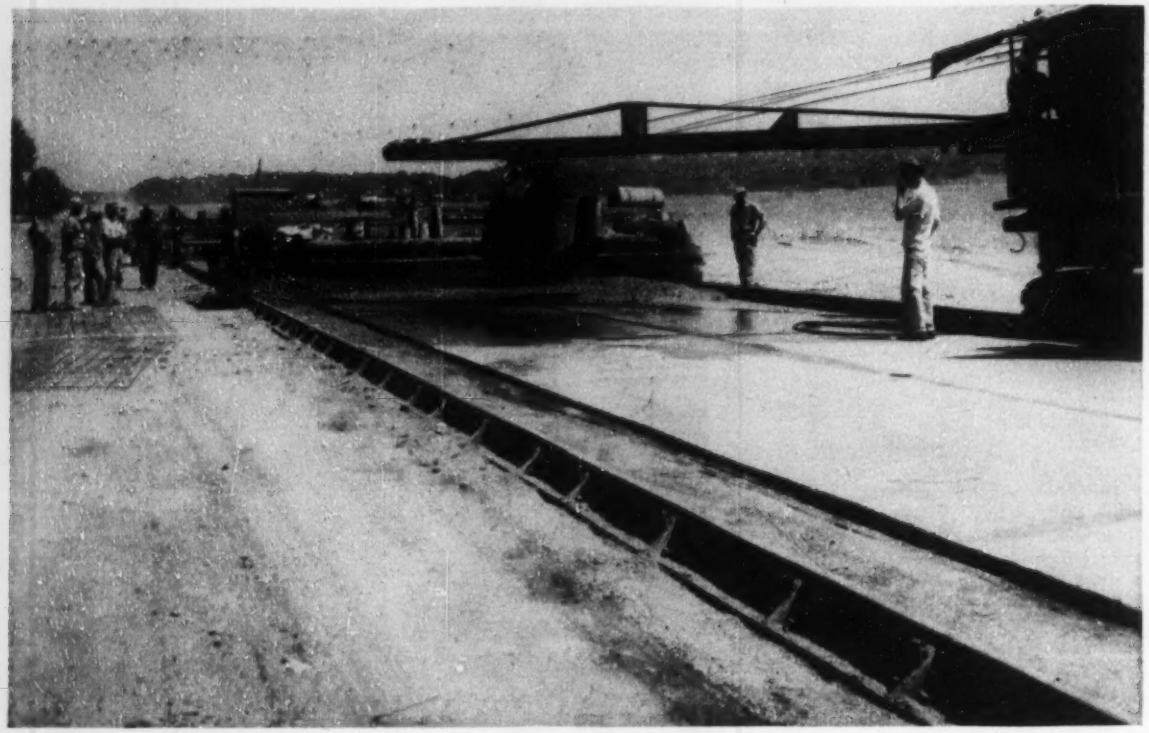


RESURFACING and widening on a 7.6-mile stretch of U. S. Route 71, Missouri, is being done with portland cement concrete.

Missouri does more concrete resurfacing

Missouri has just put down 7.6 miles of portland-cement concrete resurfacing on an old concrete pavement, to mark one more step in the state's extensive research into the best means of salvaging some of its older roads. The new work is on U.S. Route 71 in Newton County, where the 18-ft wide pavement was put down in 1924 and 1925.

The state highway department has been experimenting with concrete resurfacing since 1932.

Most recent studies were reported at the 1954 meeting of the Highway Research Board in a paper entitled "An Investigation of Concrete Resurfacing of a Concrete Pavement in Various Stages of Deterioration". The findings reported related to five test sections of resurfacing placed on a 9-6-9 in. Bates type 18-ft pavement laid in 1924 and 1925 on heavily traveled U.S. Route 40 in Callaway and Montgomery Counties.

The first two test resurfaces were placed in 1932, one with a 6-in. minimum thickness and the other with a 4-in. minimum depth. These sections were ¼-mile long each and laid over old pavement in all stages of deterioration.

The three other test sections went into service in 1936, totaled 11¾ miles, and were in three thicknesses: 4, 5 and 6 in., the thinner resurfacing being placed on pavement in better condition than that which received the 6-in. resurface. Bar mat reinforcing was used in the 1932 sections, and 43# wire mesh in the 1936 test resurfaces.

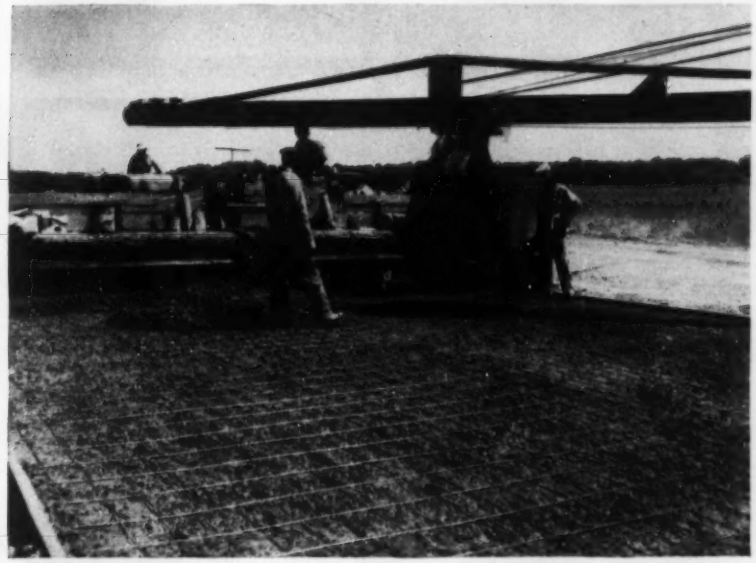
• **Thicker the better**—Careful study and detailed analysis of these resurfaced pavements in 1951 showed that the 6-in. resurfacing was more durable and theoretically more economical than the lesser thicknesses. Deterioration of the old pavement had practically no effect on the 6-in. resurface but increased in effect as the resurfacing got thinner. The thickest of the 1932 work was still giving excellent service in 1951, but the 4-in. resurface had to receive bituminous treatment in 1944 because of deterioration.

The tests indicated that better crack control might be gained by placing joints in the resurfacing, where possible, over transverse cracks (in the old pavement) that show evidence of movement.

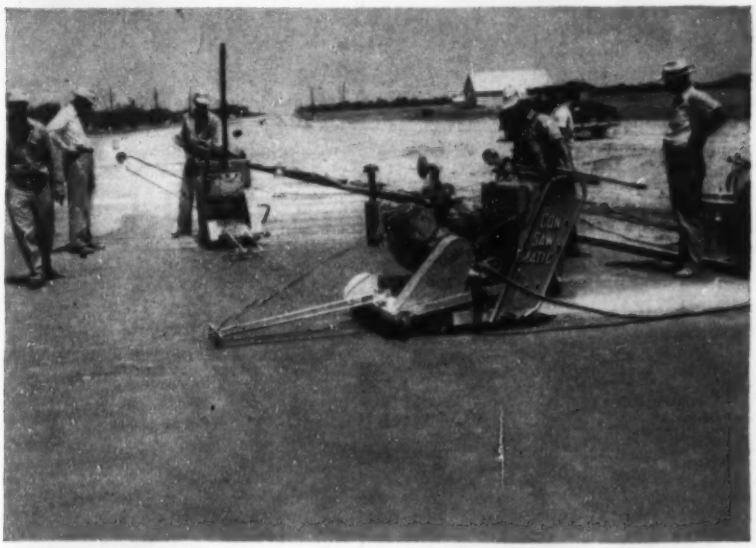
Where resurfacing slabs lay on old but uncracked pavement, there was a tendency for them to crack into lengths of between 20 and 25 ft, regardless of the thickness of the resurfacing. There appeared to be no relation between cracks in the 6-in. resurface and the condition of the old pavement underneath. However, where the 6-in. resurface was laid on old pavement with very short crack intervals, the resurfacing tended to crack less than where laid on sound old pavement. In all the test sections, when any piece of resurfacing was removed, there was no evidence of bond with the old pavement.

Full-depth pavement built in 1936 along with the test sections appeared more serviceable than appreciably greater thicknesses of comparable pavement comprising old pavement and concrete resurfacing.

• **The latest job**—In the Missouri department's most recent work, on Route 71 a minimum of 5 in. of portland-cement concrete resurfacing was used on the old surface, and a 3-ft widening on each side of the existing pavement was placed monolithicly with the resurfacing. The widening consisted of 8 in. of concrete on a 4-in. compacted granular base. The surface of the old pavement was cleaned and wet down before concrete was placed and 50 to 60# mesh used for reinforcing along with deformed bar dowels placed along the longitudinal joint about every 2½ ft.



PLACING CONCRETE for resurfacing, the paver strikes off first layer at proper level to place mesh reinforcing. Then final level of concrete is placed for full 5-in. depth.



CUTTING ALL JOINTS, both transverse and longitudinal, was done by mechanical saw about eight hours after concrete was placed—a schedule rigidly maintained.

Both transverse and longitudinal joints were sawed after the concrete was poured—a schedule followed throughout the project. Joint intervals were 20 ft. Sawing crews began work six to eight hours after the paving had started and continued sawing transverse joints for all pavement laid that day. The center longitudinal joint was sawed the following day. Abrasive blades were used for the transverse joints and diamond edge blades for the center joint.

There were three 500 ft experimental sections placed in the project: one of air-entrained concrete with wire mesh; one of air-entrained concrete without mesh; and one of specification pavement without mesh. A log is being prepared by the highway department to show relative location of joints, cracks and patches, if any, on the experimental sections.

The report to the Highway Research Board on concrete resurfacing studies in Missouri, was prepared by Don E. Gotham and G. W. Lord of the research staff of the Bureau of Materials of the Missouri State Highway Department. It will be published in the 1954 PROCEEDINGS of the board. F. V. Reagel is engineer of materials and tests for the department and Rex M. Whitton is the chief engineer.

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Write For New Illustrated Bulletin

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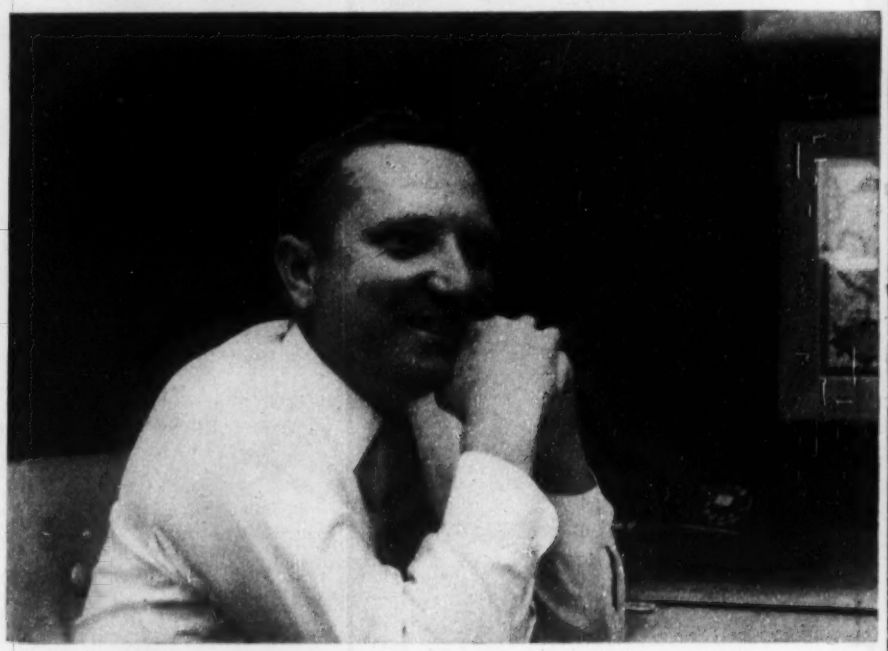
In 1938, two young men started in a little-known field out in California Now, they're . . .



TRENT DAMES, HEAD OFFICE PARTNER—"When a firm like ours grows, you run into a horrible headache in management." One of Dames' main jobs is to keep communications flowing between the firm's eight far-flung offices.

Engineers in soil mechanics for the world

The consultant to consultants is not unusual in the civil engineering profession these days. He is generally an individual who has specialized knowledge for solving a specific problem. But it is unusual for a sizable consulting firm to develop in a highly specialized field and make a success of serving other engineers and architects.

Dames & Moore, of Los Angeles, is that kind of firm. Soil mechanics—a science which got started barely 30 years ago—is its specialty. And D&M is making a world-wide go of it.

This month Dames & Moore people are pretty well spread around the globe. A sampling of their projects reads like this.

- Foundation investigations in the state of Delaware and the Republic of Colombia;
- Consulting work in Iraq on an extensive program of earth fill levees and irrigation facilities;
- A seismic survey for a taconite plant in Minnesota;
- Investigation of an unstable hillside threatening part of a chemical plant in central California;
- Foundation investigation for a major office building to go up in downtown San Francisco.

The firm with these far-flung jobs has about 90 people, scattered in eight offices from Los Angeles to London. About a third of them are civil engineers, including all eight partners. Another third have other technical skills; they are geologists, a geophysicist, subprofessional engineers, draftsmen, and laboratory technicians.

• Young science—Dames & Moore has come a long way in a few years—and so has the science with which the firm is identified. When Bill Moore and Trent Dames received their B.S. degrees from California Institute of Technology in 1933, only a few engineering schools anywhere in the world were giving courses in soil mechanics.

Cal Tech wasn't one of those schools. But Bill Moore already had acquired an interest in the subject through a chance discussion with R. R. Proctor, a soil mechanics pioneer, at an ASCE meeting held at Cal Tech before graduation. Moore asked Proctor, who was with the Los Angeles Department of Water & Power, for a summer job before he went back for graduate work.

Moore spent that summer making routine soil tests on a dam project and working on laboratory analysis of the tests. In the fall, he and Trent Dames and a few other graduate students asked Cal Tech to start a course in soil mechanics. The field was so uncharted that the course, under Prof. F. J. Converse, consisted mainly of the students reading available literature and reporting on it to each other. (The course did serve another purpose: By working together, Dames and Moore got to know each other well.)

Soil mechanics as a formally organized body of knowledge and theory was then only about a decade old. Briefly, it is the analysis of our basic construction material for such properties as grain size and shape, density, and water content to determine its strength under load. The work of Karl Terzaghi at Roberts College in Constantinople during the early 1920's is usually taken as the starting point, though some authorities date it back another decade.

At any rate, when Cal Tech set up its course, it was a rare engineer who was aware of soil mechanics as a useful branch of knowledge, and a rarer one still who felt the need of calling on it to help him design foundations. There were a few university researchers work-

BILL MOORE, ROVING CONSULTANT—"It's the old story of having to sell soap before you can sell a particular brand of soap." Now, having made his soap popular, Moore may bob up anywhere in the world where there is a knotty problem.

MAP CHECK—A technical illustrator consults one of the many terrain maps hanging in the Los Angeles office.

ing at it, and few hardy engineers—often university professors—setting themselves up as consultants.

• **Beginning to grow**—Now, twenty years later, the science is still in short pants. But it's a well-accepted branch of engineering, and its practitioners have no trouble keeping busy. The fact that soil mechanics has reached this point is in no small measure due to the trail-blazing done by Dames & Moore in all phases of the field—basic knowledge, as well as methods, equipment, and organization.

This trail-blazing has included selling the science as well as their own services. As Moore says, "It's the old story of having to sell soap before you can sell a particular brand of soap."

The two senior partners did not actually hang out their shingle until 1938. Between 1933 and 1938 they both had worked for differing periods with R. B. Labarre and Prof. Converse, two of the first West Coast soil mechanics consultants. Moore also had worked for the U. S. Coast & Geodetic Survey and the Corps of Engineers, and Dames for the Bureau of Reclamation.

At first, the two partners were the entire office force. After a couple of years, there were three others on the staff. In 1941, Moore moved to San Francisco and set up a second office.

That was the last expansion until after the war. In 1947, offices were established in Portland and Seattle, and in the following year the partners made the big jump across the U. S. to New York.

The firm had clients with headquarters in the New York area, mostly oil companies for whom it had worked

(*Continued on page 32*)

IN THE LOS ANGELES LAB—Earth samples, brought in sample cans (foreground) from field borings, are weighed for density in the laboratory.

MICHIGAN TRACTOR SHOVEL

Waukesha 195-DLC Diesel Engine

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Extra Power

for bigger loads
...more yardage
...faster

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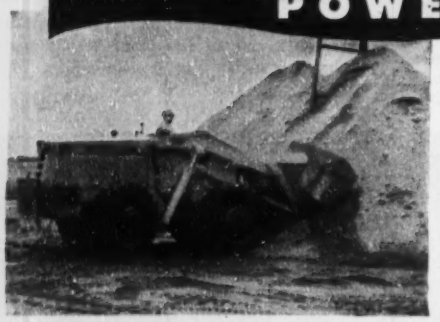

... loading compacted sand and gravel ... or spotting railroad gondolas—at Custer, Wis., plant of the F. F. Mengel Co. of Wisconsin Rapids, Wis.

This 125-A Michigan 1½ cu. yd. tractor shovel *has* the extra power when it's needed. Because of the 195-DLC Waukesha Diesel Engine, 6-cyl., 4" bore x 4" stroke, 302 cu. in. displ.—engineered-and-built into the tractor shovel's Clark Power Train by the Clark Equipment Company, Construction Machinery Division, Benton Harbor, Mich. *Get Waukesha Engine Bulletin* 1624.

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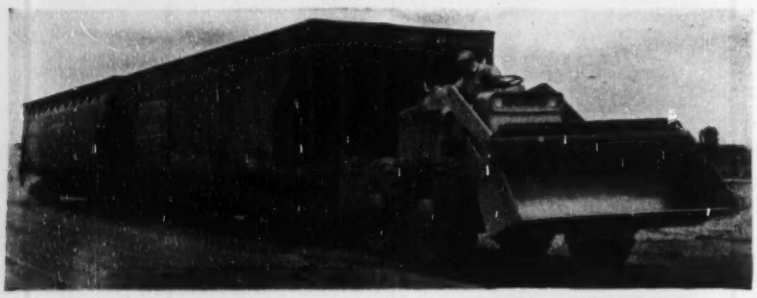

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

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on foundation studies on the West Coast and overseas. The New York office gave D & M closer connections with these clients and opened up opportunities for overseas assignments. In 1952, the firm broadened its coverage by setting up offices in London and in Salt Lake City. Last spring, it opened its newest office in Chicago.

• **Management pains**—These expansions have helped the young men associated with Dames & Moore to grow with the business. But the growing pains during these expansions were considerable.

Says Trent Dames: "An engineering office in a sub-field or specialty such as ours can run fairly efficiently to the point of two partners and about 40 employees—in two offices at most. Up to that point, functioning of the firm is directly related to the individual knowledge and capabilities of the partners. But beyond that you run into a horrible headache in management."

After a good deal of trial and error, the firm has worked out a multiple-partnership system that operates somewhat on the line-and-staff pattern.

Regional offices under resident partners are pretty much separate operating units whose efforts are coordinated by a central staff. Overall company policy is set by an executive committee consisting of the two senior partners and one resident partner elected to the committee by his fellow resident partners. Bill Moore is chairman of this committee. He acts as a roving consultant, showing up in Iraq, Pakistan, London, or Los Angeles when there is a knotty technical problem.

The Los Angeles headquarters staff, under executive partner Dames, sees that regional offices conform to policy. In this staff setup are such job descriptions as manager of technical services, manager of client professional relations, and manager of administrative services.

• **Communications headache** – This kind of head office helps meet the communications headache—a problem that is serious in any organization, but particularly for one operating in a field so lacking in precedents and technical literature. Spreading information around among offices is absolutely necessary to advance the firm's total fund of knowledge and maintain a standard of competence.

The headquarters staff gets daily reports from all regional offices, plus special reports and queries. It sends out technical information to all offices. And it performs such functions as this:

(*Continued on page 37*)

Capacity of cement plant lifted 77% with the help of U. S. Rubber belting

View of new conveyor gallery coming from No. 2 primary crusher. This cement plant uses over a mile of U.S. Belts (10 belts in all)—to handle crushed limestone rock, wet filter cake and coal.

View of U. S. Giant Style YN Conveyor Belt carrying crushed limestone rock.

The recent expansion and modernization of a midwest cement plant lifted capacity 77%, from 4500 barrels to 8000 barrels a day. During the planning stage, United States Rubber Company's 3-Way Engineering service got on the job. By working with engineers of the conveyor system and engineers of the cement plant, the most efficient system to handle the increased capacity of the plant was designed and built. In this case "U. S." engineers recommended U. S. Giant® Style YN Conveyor Belting utilizing nylon for troughability and superior impact resistance. The "U.S." 3-Way Engineering service is available for any materials-handling problem. It is a service that will always produce an efficient low cost haulage system, whether the installation is large or small.

The "U. S." belting line contains a belt for handling any type of material. Whatever your haulage problem may be, U. S. Conveyor Belting is obtainable from your "U. S." distributor. Or you may get in touch with any of our 27 District Sales Offices or write address below.

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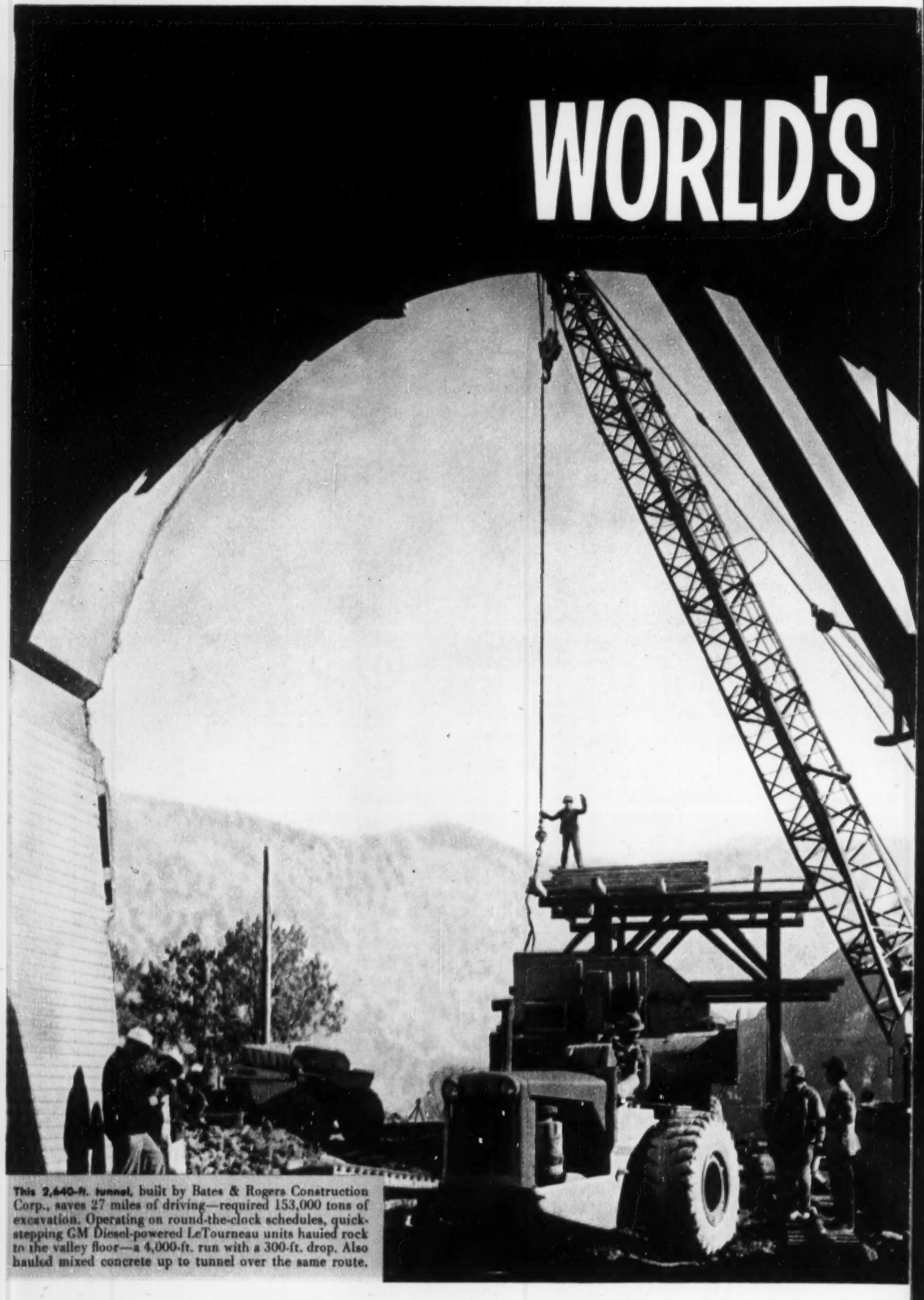
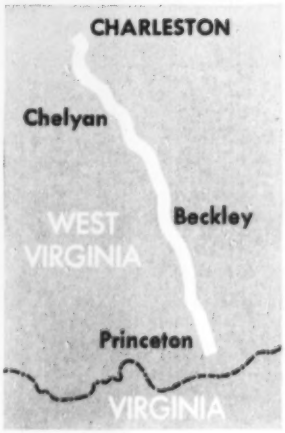
WORLD'S



This 2,640-ft. tunnel, built by Bates & Rogers Construction Corp., saves 27 miles of driving—required 153,000 tons of excavation. Operating on round-the-clock schedules, quick-stepping GM Diesel-powered LeTourneau units hauled rock to the valley floor—a 4,000-ft. run with a 300-ft. drop. Also hauled mixed concrete up to tunnel over the same route.

TOUGHEST TURNPIKE



Flattening mountains, bridging gorges and filling valleys, more than 30 large contractors literally changed the face of the earth to build the West Virginia Turnpike. This 88-mile highway eliminates tortuous turns and grueling grades of former routes—cuts driving time in half. In this operation the contractors used General Motors Diesel power in more different types of equipment than any other engine.

The faster-accelerating GM 2-cycle Diesel is the world's most widely used Diesel because it consistently outworks all other engines—gasoline, steam or other Diesels. Records show it costs less to operate and maintain. Let this great GM Diesel engine prove its superior performance and economy on *your* job, just as it has on the world's biggest, toughest jobs.

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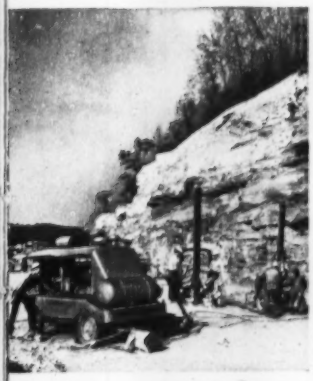
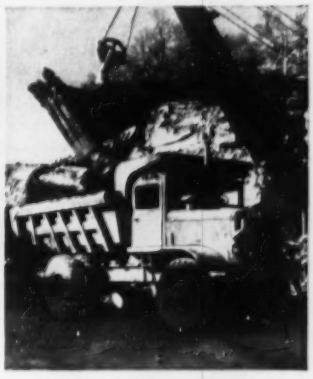


Drill and Blast—Punching holes through solid rock at the rate of about a foot a minute with air supplied by General Motors Diesel-powered Ingersoll-Rand compressor. Over 70 of these modern rotary units worked on the Pike.

Hoist and Hold—GM Diesel in Bucyrus-Erie crane gives smooth, steady power for positive load control—starts easily—warms up fast in coldest weather. Twenty-one manufacturers offer GM Diesel power in 94 different cranes and shovels, from ½- to 4½-yard capacity.

Push and Scrape—Allis-Chalmers tractor pushes LeTourneau 12-yard scraper on Ralph E. Mills Co.—Morrison-Knudsen contract. GM Diesel powers both machines. Job superintendent praises dependable performance of engines, and prompt service of GM Diesel distributors.



Load and Run—On biggest rock cut, S. J. Groves & Son moved 3 million tons in 300 days with fleet of Euclid trucks. This GM Diesel-powered unit hauls 15 tons per trip—others haul up to 50 tons. Interchangeability of GM Diesel parts simplifies inventory, cuts cost.

Two Men Can Easily Handle 14-ft Sections of Sheet Steel Culvert

You don't need special lifting equipment to unload and place long sections of galvanized-sheet-steel culvert pipe.

Take the 18-in.-diameter pipe pictured above. It is 14 ft long and it weighs 214 lbs. Two men can unload and place it in a trench in a few minutes, without equipment.

Large-diameter galvanized-steel pipe weighs only a fraction as much as pipe made of other materials. It comes in longer sections that are easier to ship.

NUMBER OF FIELD JOINTS REDUCED

The longer sections require fewer field joints, a feature that saves costly man-hours. Three 14-ft sections, for example, can be assembled into a 42-ft culvert by means of two field joints.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized-corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel more than meets the specifications set by the American Association of State Highway Officials. It carries a 2-oz zinc coating, as determined by the triple spot test. It comes flat or corrugated, in gages from 8 to 16, inclusive; in lengths 60 in. to 156 in.

Any Bethlehem sales office will gladly furnish detailed information on Beth-Cu-Loy, and the names of fabricators who use it. Write or phone.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

If the Los Angeles regional office, for instance, runs into a new problem, it will notify the head office. The head office will know whether any other regional office has coped with the same problem, and will put the two in touch.

The head office also deals with another problem—critical in a pioneer field—design and procurement of specialized equipment. Most of the soil-analyzing equipment used by Dames & Moore offices has come out of what is now the technical services department.

• **Further growth**—Having brought the firm this far, Bill Moore and Trent Dames have some definite ideas about the future.

Up till now, they have concentrated on developing equipment and methods. Says Moore: "In 1938, when Trent and I started business, the work done by academic researchers was unintelligible to practical engineers. But it was good basic work in fundamentals which could be applied practically. That's where we thought our opening was—to interpret the theories for the engineers."

Now, however, the partners are convinced that for further progress they must get into applied research. As they see it, in recent years campus research has quite properly tended to follow the pattern of pure research set in more advanced fields. The result has been that applied research has been neglected. In industry, larger corporations carry out most of the applied research. But in the civil engineering field, units have been too small to assume this responsibility.

As a result some basic practical problems in soil mechanics have been neglected. For example: So far as Dames or Moore know, there are no attempts being made to determine actual stress distribution in soil loaded externally.

"We have to assume the fundamental equations of the theory of elasticity," mourns Dames. "This assumes properties which soils do not have."

The partners feel that in the approach to such problems their firm has a definite advantage because of its broad research base—an extensive body of material developed out of the firm's varied experience.

Right now the firm is working on a manual that may eventually be a valuable contribution to the published literature of soil mechanics engineering. It's a manual in which Dames & Moore soil mechanics practices will be set forth, with special problems and their solutions.

For UNDERPASS DRAINAGE

New! SUBMERSIBLE EJECTOR with 6" DISCHARGE!

A "Big Brother" to the famous 3" and 4" Pumps

FIG. SE-890

NO PUMP HOUSE REQUIRED

Capacities to 2000 GPM

The new ejector designed for completely submerged operation is constructed with the same engineering features that have made the 3" and 4" Submersible Ejectors so trouble-free and efficient. It can be supplied with 5" or 6" discharge, with heads to 70 feet and capacities to 2000 GPM.

The new pump has been developed to answer the need for low cost installations where large quantities of water must be drained quickly. It is particularly adapted for highway underpass drainage and is designed for continuous operation during flood periods. The NON-CLOG Impeller will handle 3½" solids.

Can be supplied with control systems having no moving parts in the pits. Multiple installations are furnished with controls to program the operation for load requirements.

CONSTRUCTION FEATURES:

Motor and bearings are hermetically sealed. The motor, housing, drive shaft and impeller — all of the working parts — are an integral and interchangeable unit and can be removed without disturbing the piping. They are not subject to corrosion, deterioration or injury when standing idle—regardless of weather conditions.

The NON-CLOG Impeller is of manganese bronze; pump shaft stainless steel; permanently sealed ball bearings; volute type casing of nickel iron; motor windings of special design and construction are permanently non-corrosive; motor housing machined and sealed to exclude dirt and water.

Ask for Bulletin SE 860 B

weil PUMP CO.

1528 NORTH FREMONT STREET • CHICAGO, ILLINOIS

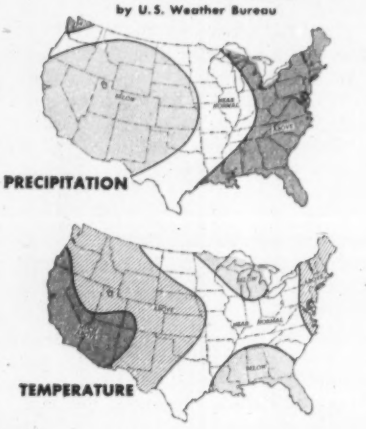
Observed weather in 20 cities, compared with normals

	Precipitation, inches				Temperature, degrees			
	Sept. 1954	Departure fr. normal	9 mos. 1954	Departure fr. normal	Mean Sept. 54	Departure fr. normal	Av. daily Maximum	Av. daily Minimum
Atlanta	0.26	−2.70	24.51	−14.09	77.8	+3.4	89.4	66.2
Baltimore	1.16	−2.20	17.69	−13.70	70.4	+2.5	81.5	58.8
Birmingham	1.24	−1.47	29.15	−12.28	78.4	+3.6	91.9	64.9
Boston	8.31	+5.32	47.82	+18.27	63.2	−1.1	70.4	55.9
Chicago	0.83	−2.40	30.27	+4.39	69.4	+3.8	79.9	58.8
Cincinnati	2.02	−0.86	28.15	−3.10	71.9	+0.3	84.6	59.2
Cleveland	1.98	−1.15	26.48	+1.77	67.8	+2.3	77.7	57.9
Dallas	2.92	+0.21	21.01	−5.69	82.2	+3.3	95.1	69.3
Denver	0.84	−0.09	5.21	−6.90	66.6	+2.9	78.8	54.4
Detroit	2.38	−0.40	22.57	−1.80	65.6	+1.3	74.6	56.5
Kansas City	0.63	−3.22	21.71	−7.00	76.5	+5.9	87.9	65.0
Los Angeles	T	−0.27	10.80	+0.90	72.5	+1.5	83.9	61.0
Minneapolis	3.65	+0.80	21.51	+0.74	60.5	−1.7	68.8	52.1
New Orleans	5.83	+0.01	37.39	−13.90	82.4	+2.1	89.4	75.4
New York	6.30	+2.63	27.34	−5.49	66.9	−0.4	73.9	59.8
Philadelphia	3.51	+0.08	28.36	−5.55	70.0	−0.7	77.8	62.1
Pittsburgh	2.31	−0.46	28.08	−1.96	69.4	+1.5	79.2	59.6
St. Louis	4.75	+1.37	22.60	−7.32	75.6	+4.2	85.6	65.5
San Francisco	T	−0.13	11.39	−1.71	61.8	+0.2	68.7	54.9
Seattle	1.66	+0.10	25.77	+6.61	60.6	−0.4	66.8	54.3

T—Traces (Less than 0.005 inches)

30-DAY WEATHER OUTLOOK

Mid-October to mid-November
by U.S. Weather Bureau



Precipitation range in 20 cities, in inches

Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Oct.	Mid Oct.-Mid Nov.	Nov.	Mid Nov.-Mid Dec.	Dec.	Mid Dec.-Mid Jan.	Jan.	Mid Jan.-Mid Feb.	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May
Atlanta	1.59/2.90	2.01/3.35	2.43/3.85	2.94/4.58	3.46/5.30	3.42/5.32	3.39/5.33	3.38/5.50	3.36/5.67	3.40/6.00	3.43/6.33	3.12/5.72	2.82/5.10	2.48/4.72
Baltimore	1.66/3.77	1.61/3.44	1.56/3.12	1.99/3.43	2.41/3.73	2.59/3.85	2.77/3.96	2.57/3.68	2.36/3.39	2.48/3.76	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30
Birmingham	1.52/2.58	1.84/3.24	2.17/3.91	2.94/4.83	3.71/5.75	3.75/5.58	3.75/5.40	3.61/5.64	3.47/5.88	4.18/6.26	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81
Boston	2.49/4.07	2.62/4.26	2.74/4.46	2.82/4.33	2.89/4.20	2.83/4.12	2.77/4.05	2.70/3.99	2.64/3.93	2.79/4.22	2.94/4.50	2.66/4.45	2.39/4.48	2.58/4.29
Chicago	1.59/3.10	1.59/2.95	1.59/2.80	1.46/2.62	1.32/2.45	1.30/2.28	1.29/2.10	1.40/2.16	1.52/2.23	1.76/2.67	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56
Cincinnati	1.49/2.90	1.74/3.28	1.99/3.67	2.14/3.48	2.29/3.28	2.32/3.54	2.34/3.80	2.07/3.40	1.80/3.00	2.10/3.64	2.39/4.29	2.66/3.94	2.34/3.60	2.42/3.85
Cleveland	1.74/3.16	1.79/2.97	1.82/2.77	1.76/2.68	1.70/2.56	1.65/2.58	1.59/2.60	1.55/2.52	1.51/2.43	1.81/2.71	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38
Dallas	1.55/3.50	1.60/3.25	1.64/3.00	1.36/3.00	1.09/3.00	1.24/3.05	1.39/3.10	1.48/2.70	1.59/2.30	1.96/3.08	2.34/3.86	2.50/4.68	2.66/5.50	2.82/5.38
Denver	0.62/1.10	0.46/0.89	0.29/0.68	0.34/0.72	0.39/0.77	0.28/0.64	0.18/0.50	0.26/0.54	0.34/0.58	0.46/0.84	0.59/1.10	0.96/1.75	1.34/2.40	1.48/2.65
Detroit	1.63/2.60	1.70/2.66	1.77/2.73	1.76/2.66	1.64/2.60	1.63/2.50	1.62/2.40	1.56/2.45	1.51/2.50	2.14/2.64	1.77/2.78	1.78/2.76	1.79/2.73	2.14/3.20
Kansas City	1.69/4.07	1.48/3.21	1.27/2.35	1.02/1.95	0.77/1.55	0.68/1.48	0.59/1.42	0.80/1.66	0.99/1.90	1.29/2.40	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40
Los Angeles	0.15/0.60	0.20/0.95	0.26/1.30	0.70/2.00	1.14/2.70	1.19/3.00	1.24/3.30	1.12/3.25	0.99/3.20	1.06/3.08	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62
Minneapolis	1.29/2.45	0.98/2.01	0.67/1.57	0.62/1.44	0.57/1.30	0.60/1.19	0.64/1.08	0.58/1.08	0.52/1.08	0.75/1.38	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29
New Orleans	1.99/4.12	2.34/4.40	2.69/4.67	2.96/4.92	3.24/5.17	3.36/5.28	3.49/5.40	3.14/5.05	2.79/4.70	3.00/5.00	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12
New York	2.09/4.13	2.15/4.04	2.21/3.95	2.42/3.86	2.64/3.77	2.55/3.71	2.46/3.65	2.41/3.88	2.36/4.10	2.35/4.08	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90
Philadelphia	1.99/3.80	2.18/3.65	2.36/3.50	2.50/3.70	2.64/3.90	2.60/3.80	2.57/3.70	2.57/3.69	2.57/3.68	2.60/3.84	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11
Pittsburgh	2.09/3.20	1.96/2.96	1.84/2.72	1.96/3.00	2.09/3.27	2.12/3.20	2.14/3.13	1.96/2.98	1.77/2.83	2.06/3.15	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58
St. Louis	1.69/3.25	1.78/3.28	1.86/3.30	1.70/3.05	1.64/2.80	1.52/2.75	1.39/2.70	1.48/2.80	1.57/2.90	1.92/3.42	2.27/3.95	2.43/3.88	2.59/4.10	2.86/4.65
San Francisco	0.19/1.20	1.12/2.25	1.04/3.30	1.62/4.28	2.19/5.25	2.34/5.12	2.49/5.00	2.24/4.86	1.99/4.71	1.96/4.13	1.94/3.55	1.30/2.54	0.67/1.54	0.44/1.12
Seattle	2.32/3.50	3.07/4.55	3.82/5.60	4.00/5.74	4.17/5.89	4.14/5.57	4.12/5.25	3.34/4.92	2.55/4.60	2.18/4.02	1.81/3.43	1.76/3.16	1.64/2.90	1.53/2.45

Mean temperature range in 20 cities, in degrees F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual temperature)

City	Oct.	Mid Oct.-Mid Nov.	Nov.	Mid Nov.-Mid Dec.	Dec.	Mid Dec.-Mid Jan.	Jan.	Mid Jan.-Mid Feb.	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May
Atlanta	62.3/63.8	56.6/58.2	51.1/52.7	46.6/48.4	44.0/46.0	48.3/50.3	43.5/45.5	44.0/46.4	45.1/47.9	47.5/50.1	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.3
Baltimore	56.4/58.3	50.9/52.6	45.6/47.0	40.2/42.0	35.8/37.8	34.2/36.1	32.9/35.7	32.4/36.0	34.6/38.0	38.1/41.7	42.0/45.7	46.6/49.4	51.9/53.6	57.5/59.0
Birmingham	62.2/64.2	56.2/58.5	50.7/53.2	46.5/48.9	44.3/46.5	43.4/46.1	43.5/46.5	44.4/47.6	46.0/49.4	48.8/51.7	52.4/54.7	56.6/58.5	61.1/62.6	64.6/65.3
Boston	54.2/56.2	49.3/51.3	43.5/45.6	36.8/39.2	31.2/34.0	28.9/31.9	27.9/31.2	26.4/29.6	27.8/30.0	31.4/34.0	35.6/38.6	41.1/43.3	46.7/48.3	51.5/53.1
Chicago	52.8/55.3	45.9/48.6	38.0/41.5	31.2/35.0	25.7/30.3	23.7/28.5	23.2/28.1	23.1/28.1	24.7/30.0	29.2/34.2	34.6/39.1	40.9/43.8	47.5/48.8	52.7/54.7
Cincinnati	54.9/57.1	48.6/50.9	42.0/44.5	35.9/39.1	31.4/35.2	30.1/34.4	29.8/34.6	29.9/34.4	31.6/36.0	35.2/39.2	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6
Cleveland	53.5/55.6	47.1/49.3	40.8/42.7	34.3/37.2	29.3/32.9	27.3/30.9	26.9/30.5	26.0/29.6	26.2/29.7	29.8/33.7	34.7/38.8	40.3/43.2	46.2/47.8	51.8/53.9
Dallas	68.5/69.4	61.4/63.1	54.3/56.7	49.9/52.3	47.0/49.3	44.8/47.1	44.1/47.5	45.8/49.2	48.8/52.2	51.9/55.6	55.5/59.6	60.1/63.7	64.2/67.3	68.4/71.1
Denver	50.8/52.8	44.5/47.2	38.0/41.4	33.5/36.7	30.5/33.5	28.3/31.4	27.0/30.0	27.9/31.5	30.5/34.7	33.1/36.8	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4
Detroit	51.9/54.1	45.8/47.9	39.2/41.1	32.9/35.3	27.9/30.9	25.6/28.5	23.8/27.7	24.2/27.8	24.6/28.9	27.9/32.1	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8
Kansas City	58.1/61.2	50.7/53.9	42.6/45.9	36.7/40.1	32.4/35.9	30.4/33.0	30.0/31.9	30.2/33.6	32.2/37.1	37.3/41.2	41.9/45.9	48.6/51.3	54.7/56.7	59.9/61.7
Los Angeles	62.7/64.2	60.5/62.1	57.9/59.8	56.5/58.2	54.9/56.5	53.4/54.8	52.7/54.0	52.6/54.3	52.9/55.1	54.1/56.3	55.4/57.4	56.6/58.4	58.1/59.7	58.8/61.3
Minneapolis	48.8/51.7	40.6/40.3	30.9/36.0	22.5/28.1	16.2/22.3	13.8/18.4	13.4/16.5	13.3/17.7	15.0/20.8	21.7/25.9	29.9/32.5	37.3/40.3	44.7/47.9	51.3/54.4
New Orleans	70.5/71.9	64.6/66.8	59.0/61.9	56.0/58.5	54.6/56.8	53.2/56.0	52.6/55.0	54.0/61.4	55.9/59.3	57.6/60.8	60.6/63.0	63.4/65.7	67.4/69.1	70.7/72.1
New York	57.0/58.6	51.8/53.2	46.5/47.9	40.2/42.3	34.6/37.5	32.5/35.2	32.0/34.6	30.9/33.6	30.9/33.6	34.1/36.8	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3
Philadelphia	55.6/57.6	50.3/52.3	45.3/47.2	39.9/42.0	35.1/37.3	32.7/35.4	31.8/35.0	31.1/34.3	32.3/35.3	36.4/39.2	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0
Pittsburgh	52.0/54.4	46.2/48.2	40.3/42.0	34.0/36.4	29.5/32.6	27.8/31.0	26.9/30.1	26.4/30.5	26.9/32.0	30.5/35.4	36.0/40.6	43.9/46.5	48.0/49.8	53.1/55.1
St. Louis	58.1/60.5	51.0/53.9	43.6/46.9	37.6/41.2	33.3/37.1	30.9/35.1	30.1/34.7	31.3/35.7	33.7/38.1	37.8/41.8	42.9/46.3	48.6/51.5	54.5/57.0	59.8/63.3
San Francisco	58.5/60.2	57.9/59.9	53.8/55.0	50.9/52.3	48.7/50.2	47.1/48.9	46.9/49.1	47.3/50.8	50.0/51.7	51.0/52.8	52.4/55.1	52.4/54.2	53.2/55.0	54.3/55.9
Seattle	51.0/52.5	41.8/43.3	43.1/44.5	41.0/42.4	39.4/40.7	37.7/39.0	37.2/38.5	38.2/40.0	39.7/42.0	41.7/43.3	43.6/44.7	45.8/47.2	48.2/49.9	51.0/52.9

New Aswan Dam

Egypt's plans for second biggest dam in world are outlined by officials

Plans for the proposed $600 million High Aswan Dam and hydroelectric project on the Nile River in southern Egypt were detailed in San Francisco Oct. 14 by Dr. Mohamed Selim, secretary-general of Egypt's Production Council.

Dr. Selim and his party, including Dr. Hassen Zaki, Egyptian minister of public works, have been touring hydroelectric projects in the U. S.

High Aswan, to be a rock-fill dam about 5 mi. upstream from the present Aswan Dam, will be second in size only to Grand Coulee. The central structure will be 320 ft high and 2,000 ft long at the crest, with wing dams on either side. Its cubage will be 65 million cu yd. Construction is expected to take 10 years.

High Aswan eventually will store 110 million acre ft, develop more than 1 million kw and provide water to irrigate 2 million acres in Egypt. The underground power house will provide space for 16 generators. Plans call for a 380-kv transmission system to span 650 mi. to deliver power to northern Egypt for irrigation pumping, fertilizer production and general use.

Unprecedented in this country, but a normal practice in Egypt, said Dr. Selim, the foundation and base of High Aswan will be built under 120 ft of water in the storage pool of the existing dam. Underwater grouting and pontoon dumping will be two of the construction techniques employed.

Core of the dam will be Aswan clay. Because of the silting conditions in the Nile, provision is made in the reservoir to accommodate silt and still provide space for 110 million acre-ft of water, or over three times the maximum storage of Hoover Dam. Useful life of the structure is set at 500 years.

Water to run the 16 generators in the underground power house will be carried in six 50-ft dia, 3,600-ft conversion tunnels. Initially, eight units will be installed. Ultimate capacity of the project will be almost three times Egypt's present total installed capacity of 365,000 kw. Production from High Aswan will be 10 billion kwhr annually, as compared with the present annual generation of 850 million kwhr.

Power will be transmitted 650 mi. to Cairo at 380 kv. Present plans, Dr. Selim related, call for 300,000 kw to be sent to Cairo, 220,000 kw to be used in the manufacture of fertilizer, and 100,000 kw for irrigation pumping in the Nile valley. Cost of power delivered in Cairo is estimated at 5 mills, as compared with the present 11-mill cost of steam-generated power in the city. Consultation on the 380-kv transmission system is being obtained from Electricite de France.

The project will be financed with money obtained in equal part from local sources in Egypt and groups outside the country. Bonds will be general obligation securities of the Egyptian government.

International briefs . . .

• **Interoceanic canal**—Colombia has announced plans to build a 350-mi waterway from the Caribbean Sea at Darien Gulf to the Pacific Ocean near Buenaventura. The $20-million waterway, using the Atrato and San Juan Rivers, is expected to be a shorter ocean-to-ocean route than the Panama Canal for Colombian coastal shipping.

• **Airbase agreement**—Libya has approved a new 20-year agreement giving the U. S. the right to maintain Air Force bases in Libya in return for economic aid. The pact is expected to permit construction of additional bases, probably in the eastern province of Cyrenaica. Wheelus Field, built near Tripoli City during World War II, already is undergoing a $60-million expansion by a U. S. construction combination.

• **Port program**—Venezuela has started preliminary work—opening roads and blasting rock—on construction of a $36-million dry dock at the port of Puerto Cabello. Besides the 672-ft long dock, the 3-year project will include a 1.7-mi access canal.

• **High finances**—Canada and the provincial governments of Ontario and Quebec have reached an unusual agreement for financing a new $1.3-million highway bridge across the Ottawa River at Pembroke, some 100-mi west of Ottawa. The project will consist of three separate bridges. Ontario will build one from its side of the river to Beckett Island. Canada will construct one from Beckett Island to Morrison Island. Quebec will be responsible for connecting Morrison Island to its mainland.

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Tri-Lok provides you with the perfect open steel flooring for areas where grease, oil and other slippery conditions make walking dangerous.

By serrating both bearing and cross bars, a positive non-slip surface in every direction is assured . . . providing safe walking and eliminating an accident hazard.

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WELLMAN

WELLMAN-BROWNING

LOCOMOTIVE CRANES

OBITUARIES

John S. Gena, 66, chief engineer of the Muskingum Watershed Conservancy District, died Sept. 27 in Dover, O. In 1931 he was assigned by Morgan Engineering, Dayton, to make a preliminary survey for the district. Later, he became chief assistant on design and construction of the project. Earlier in his career he worked with the Miami Conservancy District, and on Huffman Dam at Dayton and Pymatuning Dam on the Ohio-Pennsylvania border.

Benjamine H. Pierson, 65, Denver contractor and construction engineer, died Oct. 1. For many years a construction superintendent for Peter Seerie Construction Co., Denver, he served as general construction superintendent on the Moffat Tunnel project. Early in his career he was a construction engineer for Chicago's subway system.

John M. Barringer, 72, partner in the Greensburg Engineering Co., Greensburg, Ind., died Sept. 23.

Eugene T. McCarthy, 69, municipal director of public works at Bayonne, N. J., from 1935 to 1939, died Oct. 10.

Herman S. Sterling, 101, former Philadelphia builder and general contractor, died Sept. 30. He retired in 1914.

John A. Meehan, 59, who was in the construction business in Philadelphia for more than 40 years, died Oct. 5. He was an officer of Oxford Construction Co. and also associated with the firm of John Meehan & Sons until retirement last year.

Fred G. Moll, 85, Buffalo, N. Y., building contractor, died Sept. 29.

J. Frank Wysor, 73, veteran member of the Virginia State Highway Commission, died Oct. 8 in Pulaski, Va.

Charles M. MacGregor, 83, Oakland, Calif., contractor, died in San Francisco Oct. 13.

Charles V. Estabrook, Jr., 57, a building contractor in Buffalo, N. Y. for the past 14 years, died Oct. 4.

Robert G. Sarvis, 59, Cincinnati public works director, died early in October. Before assuming the city post in 1944, he served as deputy county engineer. He was a civil engineering graduate of the University of Cincinnati and at one time was a partner in the contracting firm of McCune & Sarvis.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS

LOW BIDS AND CONTRACTS

Consolidated Constructors, Inc., 807 Congress St., Portland, Me. CA Approx. $780,000. HOSPITAL, Union St., Proj. Maine 15, ELLSWORTH, ME. Eastern Memorial Hospital, Bd. Trustees, Ellsworth, Me. CD 10/5, under LB.

▲ **Jefferson Constr. Co.,** 75 First St., Cambridge, Mass. LB $1,447,000. Morey Junior High SCHOOL, LOWELL, MASS. City, City Hall, Lowell, Mass. Bids Oct. 14. CD 10/4.

Westcott Constr. Co., Inc., 42 Weybosset St., Providence, R. I. LB $726,804. Junior High SCHOOL, Newman Ave., SEEKONK, MASS. Town, Junior High School Bldg. Comn., c/o supt. Schools, Seekonk, Mass. Bids Oct. 14. CD 9/17.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comm., 11 N. Fourth St., Harrisburg,

C. J. Langenfelder & Son, Inc., 8427 Pulaski Hy., Baltimore, Md., LB $2,862,426, const. 4.1 mi. (Sec. 35-H) Northeastern Exten. of Turnpike, Lower Milford, Upper Milford and Lower Macungie Twps. and Emmaus Boro., Lehigh Co. Bids Oct. 14. CD 9/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John Rosenblum, Inc.,** 1860 Broadway, New York 23, N. Y., LB $754,000 general contract;

H. Sand & Co., Inc., 11 Park Pl., New York 7, N. Y., LB, $311,200, heating work;

Davidson Electric Co., 1265 Atlantic Ave., Brooklyn, 16, N. Y., LB, $312,438 electrical work for Long Island City High SCHOOL, 41 Ave. and 29 St., Queens Boro, LONG ISLAND CITY, N. Y. Director, Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. Bids Oct. 13. CD 9/14.

▲ **Syndicate,** c/o Albert J. Grosser, Lewis Tower Bldg., Phila., Pa. Owner Builds. $10,000,000. SHOPPING CENTER, 83-acre site of Colonial Country Club on Route 22, 3 mi. northeast of HARRISBURG, PA.

† **Piracci Constr. Co., Inc.,** 2552 Woodbrook Ave., Baltimore 17, Md. CA $874,870. addnl. BUILDINGS and utilities, Veterans Admin. Hospital, LEBANON, PA. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Sept. 14, awarded Oct. 5. CD 9/20, under LB.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **James McHugh Constr. Co.,** 6449 S. South Park St., Chicago, Ill., CA, $3,267,239, Div. 1 of sewage treatment plant;

Wright Contg. Co., 504 25th Ave., Columbus, Ga., CA, $756,136, Div. A, Potomac Interceptor, intercepting and trunk sewers;

Leo Butler Co., 9217 51st Ave., College Park, Md., CA, $543,320, Div. B; Commonwealth Interceptor, intercepting and trunk sewers;

Central Contg. Corp. of America, Oshkosh, Wis., CA, $508,776, Div. C, intercepting and trunk sewers;

Martin & Gass, Inc., Merrifield, Va., CA, $317,499, Div. D, Homes Run Trunk Sewer, intercepting and trunk sewers, ALEXANDRIA, VA. Grand total $5,392,970. Sanitation Auth., 113 N. Asaph St., Alexandria, Va. Bids Sept. 1, awarded Oct. 14. CD 9/3, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Southern Road Builders, P. O. Box 1129, Augusta, Ga. CA $2,945,471. Contr. No. 8, 12.6 mi. two 24 ft. lanes, rein.-con. pavement, Kentucky Turnpike Proj. No. 1, Bullitt Co. Bids Oct. 14. CD 9/27.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Breslin Constr. Co., 1433 S. Preston St., Louisville, Ky. and **R. B. Tyler Co.,** 1446 Levering St., Louisville, Ky. LB $2,389,400. Contr. 13 consists of grading, drainage paving approx. 2.8 mi. in Design Sect. C. of Kentucky Turnpike Proj. No. 1 beginning at Turnpike Centerline Station 2050 plus 00 and exten. to about Turnpike Centerline Station 2200 plus 20 incl. three 3-span, one 4-span continuous rein.-con T-beam type structures, Jefferson Co. Bids Oct. 15. CD 9/28.

▲ **Henderson & Marine Electric Assn.,** Crittenden Dr. and Phillips Lane, Louisville 2, Ky. LB $1,041,583. Bid No. 2, electrical work;

Ward Refrigeration & Engineering Co., 620 W. Kentucky St., Louisville, Ky. LB $1,001,526, Bid No. A-3, heating and ventilating work;

Biard's Plumbing & Heating, 2117 Parrish Ave., Owensboro, Ky. LB $347,974. Bid No. A-4, plumbing work;

Standard Engineering Co., Inc., 3129 Eye St. N.W., Wash. 7, D. C. LB $1,446,400. Bid No. A-5 heating, ventilating and plumbing work, for State Fair Grounds Buildings, LOUISVILLE, KY. State Div. Purchases, Frankfort, Ky. (Correction—Low Bidders). CD 9/21, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

M. B. Kahn Constr. Co., P.O. Box 595, Columbia, S. C. CA, $837,286, Westwood SCHOOL, COLUMBIA, S. C. City Bd. Educ., 1311 Marion St., Columbia, S. C. Bids Oct. 5. CD 10/13, under LB.

Smith & Jones, 936 W. Peachtree St., Atlanta, Ga., LB, $940,000. SCHOOLS, SUMMERVILLE, GA. Chattooga Co., Bd. Educ., Summerville, Ga. Bids Oct. 12. CD 9/10.

C. A. McQuarter & Pauladams, 2720 W. 1 Av., Hialeah, Fla. Force Account, $750,000, 100 RESIDENCES, ARCADIA, FLA.

N. C. Morgan, Tuscaloosa, Ala., LB, $768,000 two SCHOOLS, FLORENCE, ALA. City Bd. Educ., Florence, Ala. Bids Oct. 12. CD 9/21.

▲ **DeSoto Concrete Co.,** Fitzgerald, Ga. CA Est. $1,000,000. GRAIN ELEVATOR and OFFICES, HENDERSON, KY. James C. Ellis, 112 E. Third St., Owensboro, Ky.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Wis., Milwaukee**—OFFICE—BA 11/3—Equitable Life Assurance Society of U. S., 225 E. Michigan St., 5 story, 100x120 ft. office and parking structure, $1,250,000. Plans deposit $25. Extended date, Fritz von Grossman, 4630 W. Burleigh St., Milwaukee, and I. Clavan, 393 75th Ave., New York, N. Y., archts. CD 10/12.

Ind Michigan City—FACTORY—BA 11/8—Shell Mfg. Co., 213 W. Schiller St., Chicago 10, Ill., factory, $600,000. Hylmar Keil Assocs., 1202 Michigan St., LaPorte, archts. CD 2/24.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

▲ **Wis., Green Bay**—HOSPITAL—BA 11/4—Sisters of Third Order of St. Francis, 840 S. Webster Ave., 10 story St. Vincents Hospital, 4 story service bldg., overall 213x350 ft., concrete, steel, brick, stone, $5,500,000. Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., archts. CD 4/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **M. D. Bartolo Constr. Co.,** 2620 Market St., Youngstown, O. CA $2,500,000. SHOPPING CENTER, HAMILTON, O. James R. Williams Investment Co., Union Trust Bldg., Cincinnati, O. E. J. DeBartolo & Assoc., 2620 Market St., Youngstown, O., engrs. CD 7/8.

▲ **E. H. Marhofer Co.,** 505 N. La Salle St., Chicago, Zone 10, and **Frank Burke & Son,** 35 S. Dearborn St., Chicago, Zone 3, Ill., CA, Total est. $5,000,000. substructure only, St. Xavier COLLEGE and ACADEMY, EVERGREEN, ILL. Sisters of Mercy, 4928 S. Cottage Grove Ave., Chicago, Ill. Bids Sept. 28. CD 9/22.

LaNoble Realty Co., Ford S. LaNoble, pres., 1516 E. Michigan Ave., Lansing, Mich. Owner Builds. $950,000. 75 studio ranch HOMES, Grosbeck Hills subdivision, Hayford, Woodruff and Hopwood Aves., LANSING, MICH. Beneieke & Lorenz, 19740 James Couzens St., Detroit 35, Mich., archts.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

M. A. Swatek & Co., 1137 N. W. Second St., Oklahoma City, Okla. CA $969,000, est. $1,000,000. Water main and pumping extens., McALESTER, OKLA. City, McAlester, Okla. Bids Oct. 6, awarded Oct. 7. CD 9/9.

▲ **R. H. Fulton,** Lubbock, Tex., LB $1,900,389. coating and installing 54 mi. 30 in. steel pipe line, COLORADO SPRINGS, COLO. City, City Hall, Colorado Springs, Colo. Bids Oct. 11. CD 10/5.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **First Christian Church,** 1101 N. Robinson St., Oklahoma City, Okla. rejected bids Oct. 4, church N. W. 36 and Walker Sts., OKLAHOMA CITY, OKLA. LB $1,620,000. CD 9/3.

▲ **Girdler Corp.,** 224 E. Broadway, Louisville, Ky., CA $1,250,000. design and construct, girbotol gas-purification PLANT UNIT, PORT ARTHUR, TEX. The Texas Co., Port Arthur, Tex. CD 5/19.

▲ **Jack H. Cys Constr. Co.,** 1745 Federal Blvd., Denver, Colo., CA Approx. $1,000,000. 8 story, 87,500 sq. ft. OFFICE, BOULDER, COLO. Colorado Insurance Group Bldg., 1334 Pearl St., Boulder, Colo. CD 8/18.

FAR WEST

SOON LETS CONTRACT—BUILDINGS

Calif., Bell Gardens—PLANT—Langendorf Bakery Co., soon lets contract 169,000 sq. ft. bakery plant, $750,000. Bennett & Bennett, 1165 E. Colorado St., Pasadena, archts.

▲ **Calif.** — California Portland Cement Co., 612 S. Flower St., Los Angeles, soon lets contract cement plant, railroad and utilities, $12,000,000. Donald R. Warren, 3109 Wilshire Blvd., Los Angeles, engr.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Connolly Pacific Co.,** 1925 Water St., Long Beach and **T. E. Connolly, Inc.,** 461 Market St., San Francisco, Calif., LB, $3,877,500, constr. joint Outfall A, Unit 1C, Section 4, 12-ft. diam. tunnel, approx. 8,399 ft. long, LOS ANGELES, CALIF. Los Angeles County Sanitation District 2, 2020 Beverly Blvd., Los Angeles, Calif.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Plewe Constr. Co.,** 838 E.S. Temple St., Salt Lake City, Utah. LB $1,269,989. HIGH SCHOOL, PROVO, UTAH. Bd. Educ., 75 S. 4th West St., Provo, Utah. Bids Sept. 21. CD 8/24.

▲ **J. C. Boespflug Constr. Co.,** 605 S. Lucas St., Los Angeles, Calif., CA, $4,213,000, est. $4,000,000. Westchester High SCHOOL, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Sept. 17, awarded Oct. 8. CD 10/7, under LB.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Austin Co. Ltd.**, 425 Howe St., Vancouver, B. C., CA. Total est. $13,000,000 design and construct WAREHOUSE and OFFICE, 20 Ave., BURNABY, B. C. Dominion Glass Co. Ltd., 1111 Beaver Hall Hill, Montreal, Que. CD 12/23/52.

▲ **J. H. Ross Constr. Ltd.**, 79 Huntley St., Toronto, Ont. CA, $1,500,000. 140 suits concrete, steel, stone APARTMENT, New Park Rd., TORONTO, ONT. Al Join Investments Ltd., 79 Huntley St., Toronto, Ont. CD 7/2.

Proposed Projects

WATER SUPPLY

▲ **O., Springfield**—City, water imprvt. program, incl. pipe line from Mad River; water softening plant; imprv., present water pumping station etc. $5,777,000. Floyd G. Browne & Assoc., Box 27, Marion, consult. engrs. CD 12/1/52.

▲ **O., Warren**—Ohio Water Service Co., 235 State St., reservoir in Hartford Twp., Trumbull Co., covering 1,200 acres to impound waters of Yankee Creek, near here, $5,000,000. Burgess & Niale, 2015 W. 5 Ave., Columbus, consult. engrs.

▲ **Okla., Ponca City**—City, voted bonds Oct. 5, water wells and main extens. $1,675,000. R. D. Alexander, Terminal Bldg., Oklahoma City, consult. engr. CD 9/9.

▲ **Alaska, Anchorage**—City, City Hall, voted bonds Oct. 5, water filtration plant. $1,800,000. CD 7/16.

SEWERS, WASTE DISPOSAL

▲ **Mich., Birmingham**—City, Donald C. Egbert, mgr., interceptor sewer to serve Birmingham, Lathrup, Bloomfield Hills, Bloomfield, Troy and Southfield, connecting with Detroit System, $2,750,000.

▲ **Alaska, Anchorage**—City, City Hall, voted bonds Oct. 5, sanitary sewerage sys. addns. $2,500,000. CD 9/17.

STREETS AND ROADS

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mackinac and Cheboygan Counties—super highway from Mackinaw City 23 mi. south into Cheboygan County, $5,000,000. Harry C. Coons, engr.

▲ **NEW YORK**—State Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany,
Niagara Co.—18.0 mi. arterial highway at Niagara Falls. $11,264,000.

▲ **Tex., Dallas**—Dallas Co., Court House, cancelled bond election Nov. 2, road constr. $15,000,000; supplemental funds to complete county-wide road imprvt. program, $7,500,000. R. H. Clinger, co. engr. CD 10/5.

▲ **B. C., Vancouver**—MacMillan & Bloedel Ltd., c/o 995 West 6 Ave., 50 mi. logging roads, West Vancouver Island, $10,000,000.

EARTHWORK, WATERWAYS

▲† **California—U. S. Eng.**, 751 S. Figueroa St., Los Angeles, Los Angeles River Improvement, Part 4, Willow St. to 20 St., Long Beach, $3,000,000; Part 5, Wardlow Rd. to Willow St., $3,000,000; removing and replacing Invert Los Angeles River Channel, Arroyo Seco to Soto St., $500,000; Arcadia Wash Channel 2.9 mi. Imprvt., Arcadia, $2,500,000; Eaton Wash Channel Part 1, Encinitas Ave. to Rio Hondo Rio Hondo Basin, 2.4 mi. Rosemead, $3,000,000; Sawpit Wash Channel Part 2, 2.7 mi. debris basin to Duarte Rd., Azusa, $2,000,000., Rio Hondo Basin; 74 24-in. diam. 50 ft. deep relief wells for Whittier Narrows Reservoir, San Gabriel River Basin, Montebello, $300,000. CD 1/20/45.

▲ **Ore., Eugene**—Eugene Water & Electric Bd., City Hall, hydro-electric project at Beaver Marsh in Linn Co., 30,000-kw capacity, involves two dams. $7,000,000. Cornell, Howland, Hayes & Merryfield, Corvallis, engrs.

▲ **Utah**—Salt Lake Co. Planning Comn., 249 E. 4 South St., Salt Lake City, beach on shore of Great Salt Lake, incl. sea wall, road, sewage, water, swimming pool, etc. $4,211,000.

▲ **Newfoundland**—United Towns Electric Co. Ltd., 437 Duckworth St., St. John's, hydro-electric power plant at New Chelsea, $4,000,000, Power Corp. of Canada Ltd., engineering div., 355 St. James St. W., Montreal, Que., consult. engrs.

AIRPORTS

▲† **Tex., Victoria**—FACILITIES—U. S. Eng., Box 1229, Galveston, plans by Parr & Anderhold, archts.-engrs., 513 N. Broadway, Oklahoma City, Okla., design of Air Force Facilities at Foster Air Force Base. $5,000,000. CD 9/16.

LATIN AMERICA

▲ **Venezuela, Caracas**—HOSPITALS—Government of Venezuela, Caracas, plans Hospital de Maternidad, Ave. Andres Bellor and Hospital de Ninos in San Bernardino suburbs, $3,600,000.

FOREIGN

▲ **Greece**—Government of Greece, Athens, plans drydock at Skaramanga in Piraeus area. $4,000,000.

PUBLIC BUILDINGS

▲ **Calif., Redwood City**—SCHOOLS—Sequoia Union High School District, Broadway & El Camino Real, $6,250,000 bond election Dec. 7, high schools in Woodside and East Palo Alto. Kump Assocs. & Peter Kump, 801 El Camino Real, Menlo Park, archts. CD 9/22.

▲ **Colo., Pueblo**—SCHOOLS—Public School Dist. 60, Pueblo, voted $5,318,000 bonds Oct. 2, constr. two high schools, Junior High schools addns. CD 8/12.

▲ **D. C., Wash**—SCHOOLS—D. C. Govt., 499 Pa. Ave. N.W., Wash., D. C., school for crippled children near Mt Olivet Rd. and Holbrook St. N.E., $992,700; Garfield Elementary School addn., $427,850; McKinley Senior High School addn., $960,800; elementary school near 6 St. and Riggs Rd. N.E., $768,850; Dunbar High School addn. $826,500, school for Amidon and Greenleaf Schools, near 6 and I Sts. S.W. $1,300,000. CD 5/29/52.

▲ **Kan., Dodge City**—SCHOOL—School Dist. 1, Ford Co., $1,489,595 bond election Nov. 2, Junior High School and elementary school. CD 8/18.

▲ **Kan., Manhattan**—SCHOOL—Bd. Educ., $1,150,000 bond election Nov. 2, high school, $2,000,000. CD 10/3/51.

▲ **Ky., Lexington**—HEALTH CENTER—State, Div. Purchases, Frankfort, mental health center, Eastern State Hospital, $1,300,000.

▲ **Mich., Detroit**—OFFICE—City, Bd. Educ., 1354 Broadway, Arthur Dondineau, supt. Schools, Municipal Bldg., Bd. of Education office, Gratiot, St. Antoine and East Side Expressway. $2,000,000.

▲ **Mont., Great Falls**—SCHOOLS—Great Falls School Dist., Junior High School, $1,200,000; addns. to present schools, school administration bldg., $1,800,000. CD 9/23/49.

▲ **N. Y., West Hempstead**—SCHOOLS—West Hempstead School Bd., West Hempstead, elementary school, Cornwall and Hempstead Aves.; and 9-room addn. to George Washington School. $1,330,000. CD 7/16.

▲† **N. C., Charlotte**—ORDNANCE PLANT—Department of Defense, The Pentagon, Wash. 25, D. C., altering Charlotte Ordnance plant to manufacture nike missiles.

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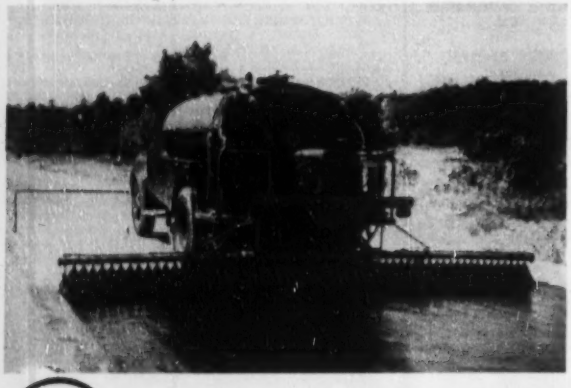

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Western Electric Co., and Douglas Aircraft Co., Inc. will operate. $16,000,000.

▲ O., Kent—DORMITORIES—Kent State University, Kent, women's dormitory and men's dormitory addn. $2,000,000.

▲ Tex., Austin—DORMITORY—University of Texas, Bd. Regents, Administration Bldg., Austin, plans by Kuehne, Brooks & Barr, 209 Perry-Brooks Bldg., womens dormitory, to house 750-women. $3,500,000. Mark Lemmon, 1210½ Main St., Dallas, consult. archt.

▲ Wis., Winnebago—LAUNDRY, etc.—State Dpt. P. Welfare, Madison, plans by Roger C. Kirchhoff, state archt., laundry and food service bldg., Winnebago State Hospital. $1,400,000.

▲ Alta., Calgary — BARRACKS — Defence Constr. Co. (1951) Ltd., 56 Lyon St., Ottawa, Ont., permanent barracks for Canadian Army at Sarcee, 11 mi. from here, $6,000,000.

COMMERCIAL BUILDINGS

▲ Ala., Birmingham—MEDICAL OFFICE—I. B. Armstrong, Jr., 1528 2nd Court West, plans by Martin J. Lide, 2919 Highland Ave. S., medical office bldg. $3,000,000.

▲ Ark., West Memphis—RESIDENTIAL SHOPPING DEVELOPMENT—Avondale Gardens Corp., West Memphis, residential and shopping development- on 943 acres, $25,000,000.

▲ Calif., Los Angeles—DWELLINGS—Araco, Inc., 120 E. Camino Dr., Beverly Hills, 238 frame, stucco dwellings, Roscoe and Strathen Sts. in Northridge-Reseda District, $2,289,400.

▲ Calif., Los Angeles—DWELLINGS—Stephie, Inc., 11261 Magnolia Blvd., 178 frame, stucco dwellings Roscoe, Kelvin Sts., Van Nuys District, $2,000,000.

▲ Ill., Chicago—APARTMENT—Herbert S. Greenwald & Samuel N. Katzin, 135 S. La Salle St., plans by Ludwig Mies Vander Rohe, 230 E. Ohio St., Chicago, Zone 4, and Friedlander, Alschuler & Sincere, assoc. archts., 223 W. Jackson Blvd., Chicago, Zone 6, two 27 story, 500 units apartment bldgs. $15,000,000. CD 9/22.

▲ Mass., Cambridge—PHYSICAL SCIENCE—Massachusetts Institute of Technology, 77 Mass. Ave., plans by Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., 7 story, brick, stone 75,000 sq. ft. physical science bldg. $2,000,000. CD 6/16.

▲ N. J., Princeton—LIBRARY—Princeton Theological Seminary, Mercer St., plans by George T. Licht & O'Connor & Kilham, 101 Park Ave., New York, N. Y., Robert Speer Memorial Library, $1,500,000.

▲ N. Y., Kew Gardens—APARTMENT—Federal Leasing Corp., 97-27 64 Rd., Forest Hills, N. Y., plans by George Miller, 125 W. 45 St., New York, Zone 19, 6 story apartment, 83 Ave. and Queens Blvd. $1,500,000.

▲ N. Y., New York—OFFICE—William Kaufman, 342 Madison Ave., Zone 17, plans by William Lescaze, 211 E. 48 St., Zone 17, 19 story office, east block front of Third Ave. between 44 and 45 Sts. $6,500,000. V. L. Falcotico & Assoc., 26 Court St., Brooklyn, Zone 2, consult. engrs. Weinberger & Weishoff, 33 W. 60 St., Zone 19, structural engr. CD 7/8/52.

▲ O., Columbus—LABORATORIES—Battelle Memorial Institute, 505 King Ave., three laboratories for research in peacetime uses of atomic energy; one to house "swimming pool" reactor; one to study operation of power generation; and one to study effect of radiation on atomic fuels. $1,250,000. CD 7/28/53.

▲ Pa., Phila.—APARTMENT—E. Frank Glassman, 5000 Woodbine Ave., apartment, Wynnefield Section, $2,500,000.

▲ Tex., Houston—SHOPPING CENTER—Lakewood Shopping Center, c/o J. C. Epps, Jr. and Norris G. Pier, 6402 Country Club Dr., plans by Arne G. Engberg, 2130 Welch St., 1 story, 125,000 sq. ft. steel brick shopping center, East Houston Rd. in Northeast Houston, 17-acre tract. $1,750,000. Walter P. Moore, 2 Pinedale St., and Bernard Johnson & Assocs., 4926 Travis St., consult. engrs.

▲ Tex., San Antonio—BANK, etc.—National Bank of Commerce, Soledad and Travis Sts., bank and office, Soledad, Martin, Pecan Sts. and The River. $4,500,000.

▲ Wis., Plymouth—COLLEGE—Mission House College & Theological Seminary, R. 3, Plymouth, plans by E. A. Stubenrauch & Assocs., 712 Erie Ave., Sheboygan, college buildings, $1,500,000.

▲ Alta., Calgary—OFFICE—Hudson's Bay Oil & Gas Co. Ltd., 534A 8 Ave. W., plans by Stevenson & Dewar, 340 7 Ave. W., 10 story, 130x150 ft., steel frame, stone office, 7 Ave and 2 St. W. $3,500,000.

▲ Man., Winnipeg—OFFICE—Ruth Realty Co. Ltd., 319 Portage Ave., plans by Green & Assocs., 310 Time Bldg., 7 story office, Portage Ave. $2,000,000. (Correction-name of owner). CD 7/27.

▲ Ont., Bronte—SHOPPING CENTER—Trafton Development Co., R. H. Gale, genl. mgr. plans by Venchiarutt & Venchiarutt, 2941 Bathhurst St., Toronto, 2,000 houses and shopping center, etc. on Queen Elizabeth Way. $4,000,000.

INDUSTRIAL BUILDINGS

▲ Ala., Guin—PLANT—Minnesota Mining & Mfg. Co., 700 Fauquier Ave., St. Paul, Minn., plant. $2,000,000.

▲ Ind., Hammond—PLANT—Standard Oil Co. & Sinclair Refining Co., 910 S. Michigan St., Chicago 5, Ill., ammonia plant. $20,000,000.

▲ O., Medina—FACTORY—Gardner Container Co., (subsidiary of Gardner Board & Carton Co.), Middletown, abandoned construction, factory to mfr. corrugated boxes. $1,000,000. CD 7/19.

▲ Pa., Midland—PLANT—Rem-Cru Titanium, Inc., Midland, 1 story brick, block, steel titanium mfg. plant addn. $12,775,000.

▲ Alta., Edmonton — PLANT — Sogemines Ltd., 1520 Mountain St., Montreal, Que., portland cement plant. $1,000,000.

▲ N. B., St. John—PLANT—Atlantic Sugar Refineries Ltd., P. O. Box 7, Montreal, Que., plant addn., Charlotte St. $2,000,000. H. G. Acres & Co. Ltd., 2135 Culp St., Niagara Falls, Ont., consult. engrs. CD 6/28.

UNCLASSIFIED

▲ Calif., Los Angeles—WHARF, etc.—Los Angeles Harbor Dpt., City Hall, one 600 ft. timber wharf and one 300 ft. concrete, steel wharf at Berth 199, San Pedro, $1,725,000; 1 story transit shed at Berth 228-230 Terminal Island, $1,220,000.

▲ O., Toledo—CARGO TERMINAL—City, City Hall, general cargo terminal at mouth of Maumee River, incl. land, dredging and fill, bulkheads, wharves, sheds, railroad tracks and yards for 400 cars, roads, adjacent to Presque Isle docks to cover 175 acres. $20,600,000. Harland Bartholomew & Assocs., 317 N. 11 St., St. Louis, Mo., consult. engrs.

▲ O., Toledo—RECREATIONAL AREA—City, City Hall, recreational area on western shore of Maumee Bay, incl. two basins, protected by dikes, parkway parallel to shoreline, etc. Approx. $2,400,000 dikes; $2,250,000 park development. Harland Bartholomew & Assocs., 317 N. 11 St., St. Louis, Mo., consult. engrs.

▲ R. I., Providence—DOCK—City, City Hall, $2,000,000 bond election Nov. 2, imprvt. municipal dock at Fields Point, land fill at Starve Goat Island. CD 8/2/49.

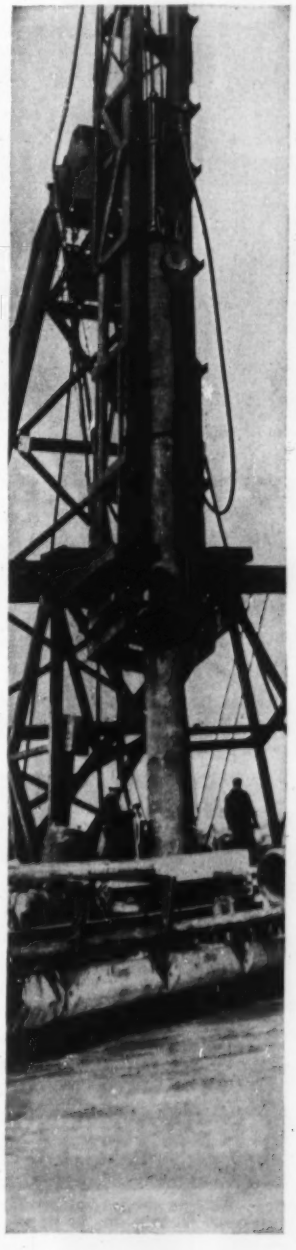
▲ Wash., Moses Lake—NATURAL GAS PIPE LINE—City, City Hall, bond election Nov. 2, natural gas pipe line and distr. system. $1,750,000.

▲† Alaska, Adak—WATER and FIRE ALARM SYS.—P. Wks. Officer, 17th Naval Dist., Kodiak, constr. and rehabilitation water and fire alarm systems at Naval Station, with storage tanks. $1,500,000.

▲ Alaska, Anchorage—PIER, WAREHOUSES, etc.—City, City Hall, Anchorage, voted bonds Oct. 5, 800-ft. pier, warehouses and other port facilities. $4,000,000. CD 4/26.

▲ Alaska, Anchorage—TELEPHONE SYS.—City, City Hall, voted bonds Oct. 5, dial telephone sys. addns. $1,500,000. CD 9/17.

▲ Ont., Toronto—CIVIC STADIUM—City, City Hall civic stadium, in Riverdale Park for baseball club, $5,000,000.



PRECISION DRIVING
of Big Steel Piles

Construction of a rail and highway bridge across the Missouri River at Garrison Dam, North Dakota, required driving 24-in. tubular steel piles, 100-ft long, into the glacial till of the river bed at six different angles to insure stability against scour, ice and floods. Many of the piles were driven to the unusual bearing load of 180 tons.

A McKiernan-Terry S10 Single-Acting Pile Hammer was chosen for this complex pile-driving job, with completely satisfactory results. The joint contractors were Missouri Valley Constructors, Inc., and Winston Brothers Co.

Whatever your own pile-driving operations may be, you, too, can rely on McKiernan-Terry Hammers to meet every requirement. Write for bulletins describing the entire line of McKiernan-Terry Double-Acting and Single-Acting Hammers and Double-Acting Extractors.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 16 Massachusetts
STREETS AND ROADS
November 2 Massachusetts November 8 Connecticut

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **George B. H. Macomber Co.**, 19 Milk St., Boston 9, Mass. CA $2,000,000. WAREHOUSE, NEWTON, MASS. Jordan Marsh Co., 450 Washington St., Boston, Mass. Bids Sept. 30. CD 9/15.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲ **Md., Baltimore**—PLANT—Bids Asked—Glidden Co., Berea and Madison Sts., Cleveland, O., plant. Total est. $10,000,000. Turpin, Wachter & Assoc., 1004 N. Charles St., Zone 1, engrs. CD 7/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **J. Rich Steers, Inc.**, 17 Battery Pl., New York, N. Y., LB, $12,477,090, Contract No. 4, structures and equip.;
Rao Constr. Co., Inc., 739 2nd Ave., New York, N. Y., LB $894,340, Contract No. 5, electrical work;
Astrove Plumbing & Heating Corp., 36-14 32nd St., Long Island City, N. Y., LB, $149,000. Contract No. 6, plumbing work;
H. Sand & Co., Inc., 11 Park Pl., New York, N. Y., LB, $179,820, Contract No. 7, heating and ventilating for constr. Bowery Bay Sewerage Treatment Works Exten., Berrian Blvd. and 43 St., Queens Boro, ASTORIA, N. Y. Dpt P. Wks., Municipal Bldg., New York 7, N. Y. Bids Oct. 13. CD 9/21.

▲ **NEW JERSEY**—New Jersey Hy. Auth., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,
Ole Hanson & Sons, 22 Franklin St., Pleasantville, N. J., LB, $2,298,788, substructure, trestles and concrete deck for Garden State Parkway Bridge over Great Egg Harbor Bay, Contract No. 173, Alternate A, from Beesley Point (Cape May) and Somers Point Egg Harbor Twp., Atlanta Co. Bids Oct. 14. CD 9/24.

No clutter or confusion at paving site. Premixed concrete delivered by Dumpcretes ready for placing.

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Non-agitated Hauling Meets Every Test

On sections C-2 and C-3 of the Ohio Turnpike there's no clutter at the paving site. No paver, no water trucks, no men to run them.

Just spreaders and finishers, plus a Dumpcrete or two discharging 4 yards of premixed concrete in 60 seconds.

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Here's the bonus. The single plant supplies concrete for bridges, culverts, walls and widening as well as paving.

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Central mixing plant located midway on job.

Slump, cylinder, beam and air test (above) all O.K.

Manufacturing Division, Maxon Construction Co., Inc.
696 Talbott Building, Dayton 2, Ohio

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Firm_____
Street_____
City_____

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DUMPCRETE
Fastest from plant to pour

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Saxwood Estates Homes**, c/o J. Herbert Burmeister, archt., 89-30 161 St., Jamaica, N. Y. Owner Builds, $2,000,000. 200 HOUSES on tract of Sunrise Hy. between Brentwood Rd. and Penatequet Ave., BAY SHORE, N. Y.

▲ **Baton Constr. Corp.**, 1717 Sansom St., Phila., Pa., CA, $2,500,000, DEPARTMENT STORE, CAMDEN, N. J. Lit Brothers, 8 and Market St., Phila., Pa. Bids Aug. 31. CD 9/1.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 3 Louisiana November 5 Tennessee

▲ **Louisiana**—CRUDE OIL PIPE LINE—Bids Asked—Magnolia Petroleum Co., N. Esperson Bldg., Houston, Tex., laying 46 mi. 12¾ in. crude oil pipe line in Gulf of Mexico from point on Atchfalaya Bay out into Gulf of Mexico and to its production platforms, $4,450,000; gathering crude lines, $500,000. CD 9/9.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **GEORGIA**—State Hy. Dpt., Atlanta,
Coffee Constr. Co., Eastman, Ga., CA, $71,221 5.073 mi. FAS Route 653, S 0653 (2), Dodge Co.;
MacDougald Constr. Co., 1640 Northside Dr., Atlanta, Ga., CA, $1,069,058, 2.618 mi. State Route 13, FI-013-1 (2), Contract 1, Fulton and De Kalb Counties;
Chas. R. Sheperd, Inc., 1275 Oxford Rd., N. E., Atlanta, Ga., CA, $2,125,940. 8 mi. State Route 13, FI-013-1 (3), Contract 1, DeKalb and Gwinnett Counties, CD 9/29;
Georgia-Alabama Paving Co., P. O. Box 367, Columbus, Ga., CA, $744,370 15.33 mi. Swainsboro-Louisville Rd., Emanuel Co.; CA $1,479,200 37.395 mi. State Route 89, F-075-1 (3) and F-088-1 (6), Echols and Clinch Counties;
J. F. Cleckley & Co., Orangeburg, S. C., CA, $1,057,610 27.409 mi. State Route 73, F-068-2 (2), Screven Co.;
Wright Contg., Co., 506 Cooledge Ave., Columbus, Ga., CA, $550,111 2.62 mi. SR. 85, U-174-1 (1) and F-074-1 (5) Muscogee Co.;
Holland Constr. Co., Mt. Vernon, Ga., CA, $101,601 3.935 mi. FAS Route 1473, S 1473 (2), Johnson Co. Grand total $7,199,111. Bids Oct. 8. CD 10/15, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 4 Wisconsin
STREETS AND ROADS
November 4 Wisconsin

▲ **Ill., Chicago**—TELEVISION STUDIO—Bids Asked—Columbia Broadcasting Co., 400 N. Michigan Ave., Chicago, Zone 11, conversion arena to television studio, Erie and McClure Sts., $3,000,000. Andrew Rebori, 150 N. Wacker Dr., Chicago, Zone 6, archt. and De Lewu Cather & Co., 50 N. Wabash Dr., Zone 6, engrs. CD 1/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., Columbus,
The Koski Constr. Co., 4544 Main ave., Ashtabula, O. LB $209,480, est. $202,600. Type T-35 2.132 mi. SR 84-19.77, SR 90-(26.55-27.97) S-51 (2), Ashtabula Co.;
Sutton & Stewart, Inc., Main St., Bridgeport, O. LB $79,845, est. $89,500. Type T-35 and structure 0.1 mi., SR 646-(6.53-6.61), S-178 (2), Harrison Co.;
Ralph Myers Contg. Corp., Box 235, Salem, Ind. LB $1,342,465. est. $1,828,500. Type T-71 and structure 1.834 mi., SR 7-(4.67-6.06), FG-430 (10), Jefferson Co.;
Shelly & Sands, Inc., Thornville, O. LB $1,278,312, est. $1,288,000. Type T-35 13.531 mi., USR 30S (16.73-18.81), Allen and Hardin Counties;
The W. J. Seidensticker Co., 3585 E. Fulton St., Columbus, O. LB $1,299,757, est. $1,382,200. Type T-71 and structure 4.786 mi., USR 52-(16.74-20.65), Brown Co.;
The Horvitz Co., 913 Midland Bldg., Cleveland, O. LB. $845,552, est. $1,157,700. Type T-71 2.52 mi. SR 17-2.99, Cuyahoga Co.;
Homer A. Merritt, 444 Broadway, Lorain, O. LB $349,685, est. $409,400. Type T-71 0.894 mi., USR 6-(27.74-28.47), Erie Co.;
Max J. Zeller, Inc., 297 S. High St., Columbus, O. LB. $102,804, est. $111 550. Type T-35 4.2626 mi. USR 36.0.00, USR 36-20.89, Harrison and Tuscarawas Counties;
Bruns Coal Co., Inc., 101 Lind Arcade Bldg., Zanesville, O. LU $1,639,362, est. $2,142,250. Type T-35 1.823 mi., SR 7-(18.59-19.59), Jefferson Co.;
V. N. Holderman & Sons, Inc., 890 Oakland Park Ave., Columbus, O. LB $992,472, est. $1,176,500. Type T-71 T-35 and structure 4.618 mi., USR 23-(13.05-17.66), Pickaway Co.;
The Ohio Engineering Co., 105 Sixth St., Lorain, O. LB $287,500, est. $288,400. Type T-35 1.688 mi., USR 224-(10.35-10.66), SR 18-11.66, Seneca Co.;
Ohio Valley Paving Corp., 34 and Belmont Sts., Bellaire, O. LB $62,688, est. $80,000. Type T-30 and T-35 7.97 mi. Tuscarawas Co. Bids Oct. 14. CD 9/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frosch Brothers,** 2922 W. 16 St., Indianapolis, Ind., Owner Builds, $2,500,000. 90 stone, brick HOMES in Nottingham Park, INDIANAPOLIS, IND.

▲ **E. H. Marhoefer Jr. Co.,** 505 N. La Salle St., Chicago, Ill., CA Est. $2,400,000. general contract HOSPITAL addn., MILWAUKEE, WIS. Mount Sinai Hospital, 908 N. 12 St., Milwaukee, Zone 3, Wis. Bids Aug. 25. CD 8/17.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

November 5 Minnesota

STREETS AND ROADS

November 5 Minnesota

▲ **Texas and New Mexico**—PRODUCTS PIPE LINE—Bids Asked—Standard Oil Co. of Texas City Natl Bank Bldg., Houston, Tex., 248-mi. products pipe line from El Paso, Tex. to Albuquerque, N. M. $3,650,000. CD 6/17.

▲ **Texas**—OIL LINE—Bids Asked—Standard Oil Co. of Texas, City Natl. Bank Bldg., Houston, laying submarine crude oil line from offshore to point in Gulf near Padre Island, 24 mi. s. w. of Corpus Christi, $3,000,000; laying gathering pipe line to offshore oil field from mainland, $400,000. CD 9/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **General Electric Co.,** Electric Bldg., Omaha, Neb. CA $2,700,000. furnish, erect one 100,000 kv. steam turbine generator;

Westinghouse Electric Supply Co., 117 N. 13 St., Omaha, Neb. CA $139,774. transformers, for North Omaha Power Plant, OMAHA, NEB. Omaha Public Power Dist., 17 and Harney Sts., Omaha, Neb. Bids Oct. 8. CD 8/17/51, under Public Buildings.

▲ **Oklahoma Gas & Electric Co.,** 321 N. Harvey St., Oklahoma City, Okla. Owner Builds. $20,000,000. 170,000 KV steam generating station at Riverbank Plant, near Muskogee, OKLAHOMA. Pioneer Service & Engineering Co., 231 S. LaSalle St., Chicago 4, Ill., engrs. CD 8/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Tellepsen Constr. Co.,** P.O. Box 2536, Houston, Tex., CA, $3,500,000, 4 story bsmnt., 14 story tower, MEDICAL TOWERS BLDG., 3 lower floors to provide parking garge area, HOUSTON, TEX. Martin Nadelman & Assocs., 5305 Blythewood St., Houston, Tex. CD 7/15.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

November 4 Washington November 10 California

STREETS AND ROADS

November 4 Washington November 10, 12 California

BIDS ASKED—BUILDINGS

▲ **Calif., Anaheim**—LABORATORY—BA 11/12—Richfield Oil Co., 555 S. Flower St., Los Angeles, research laboratory, library, shops, etc. $3,000,000. CD 7/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Morrison-Knudsen Co., Inc.,** 411 W. Fifth St., Los Angeles, Calif., CA, Total est., $12,000,000. site grading for cement PLANT, 9-mi. west of MOJAVE, CALIF. Redlock Corp., 612 S. Flower St., Los Angeles, Calif. Awarded Oct. 8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Eichler Homes Co.,** 2001 E. Camino Real, Palo Alto, Calif., Owner Builds, $3,000,000, 160 HOMES, in Terra Linda Tract, SAN RAFAEL, CALIF. Jones & Emmons, 8925 Beverly Blvd., Los Angeles, Calif., archts.

▲ **George A. Fuller Co.,** 3100 W. 8 St., Los Angeles, Calif., CA $2,525,000, TELEPHONE OFFICE BLDG., SANTA MONICA, CALIF. General Telephone Co. of Calif., 1314 7 St., Santa Monica, Calif. CD 10/6, under LB.

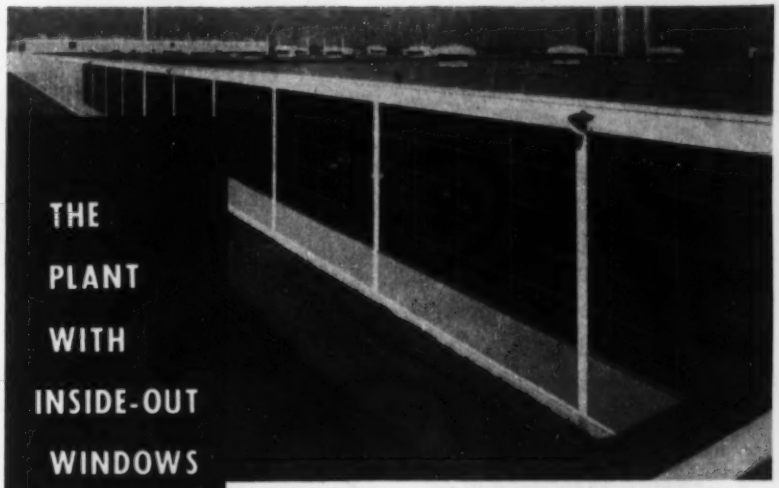
CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **McNamara Constr. Co. Ltd.,** 42 Industrial St., and **Peacock & McQuigge Ltd.,** 1109 Millwood Rd., both Toronto, Ont. and **Pigott Constr. Co., Ltd.,** 36 James St. S., Hamilton, Ont., CA, $2,314,500. deep channel across Montreal Harbor between Jacques Cartier and Victoria Bridges, Canadian Section of St. Lawrence Seaway ONTARIO and QUEBEC. Dpt. Transport, Ottawa, Ont. CD 9/9.

(Proposal Advertisements see pp. 50 to 52)



Luxlite Coolite (glare reduced) installed in sidewall sash at Sawyer Biscuit Company, Melrose Park, Illinois.
Skidmore, Owings & Merrill, Architect, George A. Fuller Company, General Contractor, Hamilton Glass Company, Glazing Contractor.

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UNIT PRICES

Excavation bid lands Oregon highway job

Funderburk Constr. Co. is building 4.364 mi of North Umpqua Forest Highway in Douglas County, Ore., for $504,922, 10% under second bid. Consulting engineer is F. O. Montgomery, Glide, Ore.

The Funderburk price for unclassified excavation, 18% and $80,850 under second, clinched the contract.

Steep side hill construction along the North Umpqua River, with fills into the river, is protected with derrick-placed rock embankment. To avoid flooding during the wet seasons, tops of slopes often run to 100 ft.

Work started in July; completion time is 430 days.

Bidders include:

1C Funderburk Constr. Co., Sutherlin, Ore.	$504,922
2 Morrison-Knudsen Co., Inc., Seattle, Wash.	563,252
11 Babler Bros. Inc., Portland, Ore.	789,604

Bids: 6-28-54 Item	Unit	Quantity	Unit Price 1C	Unit Price 2
Clearing	ac	2	$700.00	$500.00
Grubbing	ac	32	700.00	375.00
Select rem trees & snags	sf	100	5.00	5.50
Uncl exc	cy	539,000	0.70	0.85
structures	cy	700	5.00	4.00
borrow	cy	3,000	0.70	0.55
Overhaul, station-yard	stay	2,000,000	0.01	0.015
cu-yd-mile	cymi	20,000	0.30	0.30
borr(M free)	cymi	2,000	0.30	0.30
CMP bit ct culv 18"	lf	2,050	5.00	5.60
30"	lf	70	11.00	10.00
CMP bc, flare inlet,18"	lf	418	6.00	6.00
24"	lf	58	9.00	9.00
30"	lf	120	13.00	11.00
36"	lf	52	16.00	16.00
60"	lf	156	30.00	40.00
Rem, clean & stkpile salvaged culv pipe	lf	700	2.00	3.00
Derrick-pl rock embank	cy	24,000	2.00	1.00
CMP, bc, perf, corr, galv, underdrain 8"	lf	200	3.00	4.00

Low of 25 bids on Utah dam is 33% below estimate

Utah Construction Co., Salt Lake City, bid $2,423,000 for the construction of Wanship Dam for the Bureau of Reclamation. This was 18% below the second and 33% below the engineer's estimate. In a field of 25 bidders, 11 were below and 14 above the estimate.

Wanship Dam is part of Weber Basin project, Utah. Principal items are 11,750 cu yd concrete; 2.5 million cu yd excavation; 2.74 million cu yd dam embankment. Completion time is 1,000 days.

The Utah Co.'s price for sand, gravel and cobble fill in dam embankment was $111,240 below that of second bidder. Altogether, the successful contractor's bid was $520,000 under second.

Bidders include:

1C Utah Constr. Co., Salt Lake City, Utah	$2,423,004
2 Texas Constr. Co., Dallas, Texas	2,942,948
25 McNutt Brothers and Carl Halvorson, Inc., Eugene, Ore.	5,041,846
EE Bureau of Reclamation, Ogden, Utah	3,603,210

Bids: 6-10-54 Item	Unit	Quantity	Unit Price 1C	Unit Price 2
Diversn & care of river dur constr & unwat fndn	ls	1	$70,000	$98,000
Excavation:				
dam embank fndn	cy	160,000	0.24	0.34
grt cap to 5'	cy	500	15.00	23.00
5-8'	cy	120	23.00	38.00
open cut for spway & outlet works	cy	250,000	0.81	1.08
outlt wk tunnl & gate chmbr	cy	5,325	25.70	26.00
strip borrow pits	cy	235,000	0.16	0.22
bor area & transp to dam embank, to 1,050,000 cy	cy	1,050,000	0.22	0.313
ov 1,050,000 cy	cy	1,050,000	0.19	0.204
Perm str stl ribs, stl tunnl-liner plate, stl lagging, f&p	lb	50,000	0.17	0.22
Tunnl roof suppt bolt	lf	250	1.25	3.60
Sprayed prot coating	sy	7,000	0.47	0.70
Pervious backfill	cy	19,000	0.76	0.50
Fill mine tunnels	cy	680	4.75	15.00
Earth fill dam emb, zn 1:				
first 800,000 cy	cy	800,000	0.13	0.132
over 800,000 cy	cy	800,000	0.11	0.066
Spec compact earth fill	cy	2,000	3.10	3.50
Sand, grav & cob fill, dam emb, zone 2:				
place & compact	cy	80,000	0.06	0.12
first 540,000 cy	cy	540,000	0.29	0.473
over 540,000 cy	cy	540,000	0.24	0.263
Spec compact zone 2	cy	600	2.10	6.00
Misc fill, dam emb zn 3	cy	205,000	0.07	0.044
Riprap, procure & place	cy	76,000	2.03	2.75
F&p dr w uncemented jts:				
sew pipe 12", emb toe	lf	2,000	4.50	4.50
perf 4"	lf	1,100	1.90	2.00
6"	lf	1,850	2.60	3.00
8"	lf	1,000	3.60	4.00
12"	lf	80	5.40	5.00
F&p dr w cemented jts:				
sew pipe 4"	lf	60	0.90	1.00
8"	lf	80	2.00	2.00
Drill:				
drainage holes	lf	450	3.00	4.70
grout holes 0-30'	lf	5,400	2.13	1.75
30-60'	lf	2,150	2.13	1.80
60-110'	lf	1,500	2.50	1.90
& case grt holes thru overburden	lf	620	4.70	5.00
for anchr bar & grtg bars in place	lf	13,300	0.72	1.50
Pipe, fitg, spec grt outlt	lb	2,260	0.94	0.90
Hook-up to grt hl & conn	hole	226	7.50	12.00
Pressure grouting	sack	17,000	1.69	2.10
Cement, furn & handle	bbl	21,000	4.83	5.00
Reinf bars, f&p	lb	1,250,000	0.13	0.15
Concrete:				
grout cap	cy	360	19.00	20.00
spillway crest struct	cy	370	25.00	30.00
floors	cy	3,185	21.00	20.00
walls	cy	3,175	38.00	49.00
Outlt wks:				
intake struct	cy	590	35.00	50.00
contrl house	cy	50	73.00	160.00
stilg basin	cy	1,530	32.00	30.00
second stage	cy	850	58.00	50.00
tunnl & gate chmbr lining	cy	1,490	49.00	52.00
misc structs	cy	145	42.00	90.00
Waterstops, rubber, pl	lf	142	3.00	3.00
metal, f&p	lf	1,000	3.80	2.75
Metal seals f&p M2	lf	2,200	2.50	3.00
N1	lf	350	1.40	3.00
Metal doors, f&i	sf	65	15.00	15.00
Roofing, f&p	sf	620	0.50	1.00
Exc detour rdway	cy	13,000	0.60	1.00
CMP 16 ga 18"	lf	295	3.70	7.00
12 ga 42"	lf	60	14.00	15.00
Treated timb gd post	ea	160	5.00	8.00
Surf settl pt, dam embnk	pt	44	5.00	15.00
Chain link fence, f&p	lf	280	3.00	2.00
Elec met cond, to 1"	lf	800	1.00	2.00
1½", f&i	lf	20	1.60	3.00
conduct & ground,	lb	120	1.25	3.00
Install:				
Stl outlt pipes	lb	285,000	0.05	0.12
Met P, fitg & vlv und 6"	lb	2,350	0.55	0.40
ovr 6"	lb	7,100	0.37	0.25
18" cyldr-type reg vlv	lb	4,000	0.11	0.50
Ventilating system	lb	2,450	0.25	0.40
Sump pump	lb	350	0.20	0.30
HP gate & cond lining	lb	114,300	0.06	0.11
Contrl app for HP gates	lb	2,800	0.11	0.50
Reserv level ga & piping	lb	1,850	0.31	1.00
18" line meters	ea	2	50.00	400.00
Trash racks	lb	25,500	0.06	0.15
Embedded metal work & anchr	lb	515	0.68	0.20
Metal covers & gratings	lb	900	0.16	0.15
Ladders & handrails	lb	500	1.10	0.30
Elec apparatus	lb	110	1.00	3.00
Lighting fixtures	ea	5	13.00	20.00

Industrial building: this year and the next

The table and chart (below) tell a significant story about industrial buildings in the U. S. The table shows what has been happening to it in this "readjustment" year. The chart suggests where industrial building may be going in 1955. ENR already has estimated that 1955 awards will be 6% above the 1954 total.

For the first nine months of this year, industrial awards reported to ENR are down 29% from the same 1953 period. The table shows that the big decline, both percentagewise and in dollar volume, has been in public utility construction. In the process industries (including chemicals, petroleum, nonferrous metals, paper & pulp, plastics and synthetic fibers and others) new building awards are down only 14%. But there have been sharp declines in new steel refining and rolling facilities, and in auto plants, in textile mills, and in the radio-TV-electronics group.

By contrast, investment in new machinery and parts facilities, food plants, and aircraft plants is up. Food processing was the only category in which there are more individual contracts than last year.

• **Good signs**—A look at the chart will give you considerable cause for optimism about the months to come. Most of this year's decline in industrial building awards came in the first quarter, when total volume was 67% below the same 1953 period. In the second and third quarters, industrial awards turned up, averaging over $42 million weekly. That was 10% above average weekly volume in the corresponding six months of 1953.

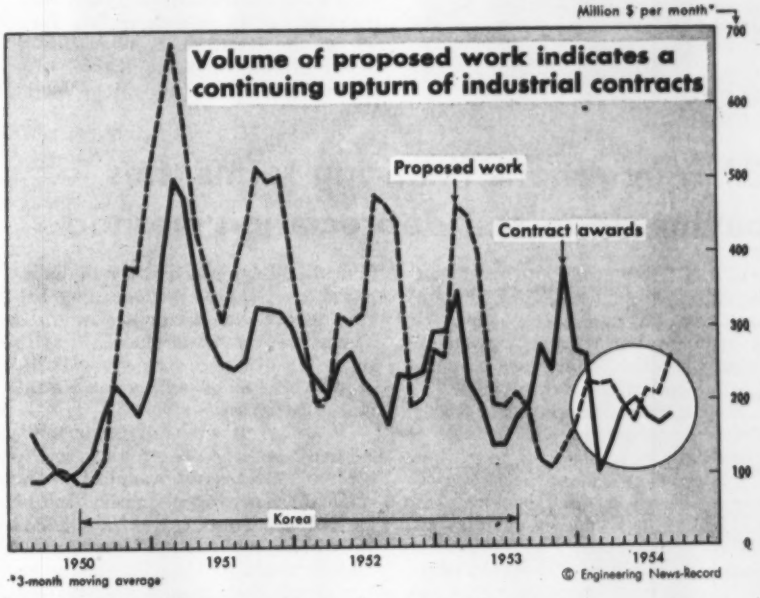
Industrial awards in the last quarter of 1954 aren't expected to come close to 1953's record fourth-quarter volume. However, industrial building volume should keep rising.

• **Backlog support**—The reason for this is, of course, ENR's growing backlog of proposed industrial work. As 1954 has progressed, a steadily rising volume of proposed work has been added to the backlog. While in the first quarter less than half as much industrial building was proposed as in 1953, the second quarter was only 14% below the same 1953 period, and the third quarter was 36% ahead of 1953.

ENR's industrial backlog is nearly $11.4 billion, close to the all-time high. It has risen slightly during the past 12 months, which means that new industrial projects are being proposed at least as fast as projects are going into contract.

• **Regions**—The Middle Atlantic area and New England have done best on industrial contracts among U. S. regions so far this year. The Middle Atlantic is up 59% from the same 1953 period, while New England is up 36%. The West-of-Mississippi area still leads in volume of awards, but is

(Continued on page 48)



Industrial building contracts by type of industry—first nine months 1953-1954

(As reported to Engineering News-Record and Construction Daily)

Industry	Dollar value in millions			Number of contracts		
	1954	1953	% chg 53-54	1954	1953	% chg 53-54
Manufacturing	**1,209.8**	**1,388.8**	**−13**	**1,589**	**1,940**	**−18**
Process	592.2	688.4	−14	324	426	−24
Machinery & Parts	196.5	148.5	+32	305	354	−14
Metal refining, rolling	71.6	158.1	−55	21	24	−12
Foundries	1.0	2.0	−50	6	15	−60
Food	136.1	116.7	+17	333	260	+28
Aircraft	38.4	23.7	+62	30	31	− 3
Auto	22.5	68.6	−67	17	22	−23
Textiles	17.0	24.3	−30	33	74	−55
Wood products	11.5	6.2	+85	37	42	−12
Radio, TV, electronics	2.9	15.8	−82	7	19	−63
General	120.1	136.5	−12	476	673	−29
Public utilities	**208.0**	**585.2**	**−64**	**62**	**96**	**−35**
Transportation & service	**37.1**	**71.7**	**−48**	**127**	**250**	**−49**
Railroad	10.2	18.1	−44	16	47	−66
Automotive	25.2	46.0	−45	104	190	−45
Refrig. & cold stor.	1.7	7.6	−78	7	13	−46
Total, all industries	**1,454.9**	**2,045.7**	**−29**	**1,778**	**2,286**	**−22**

off 31%. The Middle West is off 53%, the Far West 46%, and the South 24%.

A look at regional backlogs suggests that industrial buildings will be kept busy in most regions. New England's small $235-million backlog has increased 33% in the past 12 months. The much bigger backlogs of the Middle Atlantic and South are up 6% and 8%, respectively. The Middle West backlog is substantially bigger than either of these. It's now almost $2.8 billion and up 3% in the 12 months ending Sept. 30. The West-of-Mississippi region has the biggest backlog of all ($4,040 million) but is down 3% in the 12-month period. The Far West's smaller backlog ($837 million) is down 21%.

• **Plant location**—The trend is for manufacturing plants to locate away from the major metropolitan areas. An analysis of ENR awards of over $100,000 made by the Territorial Information Department of Commonwealth Edison Co., Chicago, shows that plant awards in the 24 leading metropolitan areas were only 5.1% of total ENR manufacturing plant contracts in the 12 months ending June 30 of this year. This represents a steady decline from the 12.7% ratio of the first five years after World War II.

C.I.T. lengthens financing terms, ties payments to fast-depreciation method

C. I. T. Corp., the industrial financing subsidiary of big C. I. T. Financing Corp., has announced a new way of financing construction equipment, based on the faster depreciation schedules of the new tax law.

Under the plan, buyers of construction equipment will be able to stretch out their financing for as long as six years to more nearly match useful life of expensive machines. Up till now CIT's maximum term has been three years, and commercial banks generally have been unwilling to let such loans run longer than two years.

CIT feels that the situation has been changed by the new tax law, which puts contractors in a better cash position by speeding up their depreciation allowance against income tax. The equipment buyer can see his tax savings more clearly, as he ponders the pros and cons of buying vs. renting. Tax expert Joseph Schwartz spelled out the details for ENR readers earlier this year (ENR July 29, p. 91; Sept. 30, p. 53).

• **Typical deal**—Here's how a typical deal might work under the CIT plan. A contractor buys a $40,000 piece of equipment, making a down payment of $10,000 and financing the rest. (Down payments are often 25%, sometimes lower.) Instead of paying off the unpaid balance in 36 equal monthly installments, he pays off in 72 unequal monthly installments, heavy at first and gradually declining.

These monthly payments are figured on the sum-of-the-years' digits method, which Schwartz explained in the above-mentioned ENR article. Basically, this method is a more complicated version of the declining balance method of fast depreciation. It allows about 71% of the depreciable cost of a machine with a useful life of six years to be written off in the first three years.

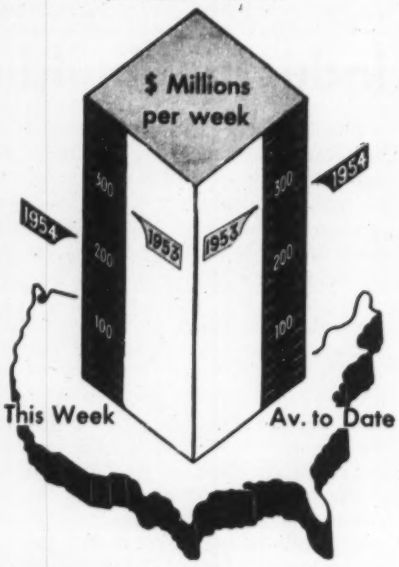
• **Finance charge**—The finance charge will be 4¼% per year, applied to the original balance of the loan. In the case of the contractor who has borrowed $30,000, the total finance charge would be $7,650 for the six years, and the contractor would sign a note for $37,650. This note is gradually reduced, at the rate of 2.4% of the original note each month in the first year, 2.0% the second year, and so on down to 0.33% per month in the sixth year.

Actually, of course, the new method is no advantage to the contractor who can afford to pay off his note in three years or less. He pays about 70% of his loan within three years, anyway. But he keeps on paying at the rate of 4¼% on the original $30,000 for another three years. This means a simple interest charge of a little more than 11% annually, since the average amount of the loan outstanding for the entire period is much less than the original $30,000.

The point is, however, that it may be worth that much to a contractor to "fund his debt." For instance, he may easily be able to earn more than 11% through the greater efficiency of having equipment for which he can't afford to pay cash. And in some cases, a contractor with limited means facing severe competition may have no alternative but to seek six-year terms.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 43 wks 1954	1953	% chge
Federal	$7.2	$1,039.3	$1,257.9	−17
State and municipal	99.9	4,092.6	4,180.5	−2
Total public	107.1	5,131.9	5,438.4	−6
Total private	113.1	6,692.0	7,068.9	−5
U. S. total	$220.2	$11,823.9	$12,507.3	−5

Contracts by type of work

Waterworks	$7.1	$200.2	$197.9	+1
Sewerage	6.4	317.6	362.5	−12
Bridges	7.5	416.3	579.6	−28
Highways	48.1	1,580.3	1,495.5	+6
Earthwork, waterways	2.7	272.2	312.4	−13
Buildings:				
Public, excl. hsg.	31.9	1,449.7	1,435.6	+1
Housg., public	...	198.4	339.5	−42
Housg., private	55.8	3,491.5	2,997.0	+16
Commercial	21.8	1,122.6	979.2	+15
Industrial	32.4	1,572.9	2,282.5	−31
Unclassified	6.5	1,202.2	1,525.6	−21
Total	$220.2	$11,823.9	$12,507.3	−5

NOTE: Minimum size projects included are: waterworks and waterways, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)

	Week of Oct. 21 1954	Cumulative 42 Wks 1954	% chge '53-'54
Corporate securities	$65.8	$2,410.9*	−34
State and municipal:			
All except housing	42.9	4,361.6	+30
Housing	...	91.0*	−62
Federal loans	7.0	100.7	+8
Federal aid	...	673.0	−13
Total non-federal	$115.7	$7,637.3*	−6
Federal appropriations:			
In U. S.	...	$2,073.3	+32
Outside U. S.	...	33.2	+15
Total new capital	$115.7	$9,743.8*	+1

* Previous two weeks revised.

ENR cost and volume indexes, 1954

		Base years = 100 1913	1926	1949
Construction cost	10/21	642.31	308.76	134.65
	9/30†	641.89	308.56	134.56
Building cost	10/21	455.96	246.48	129.61
	9/30†	455.54	246.25	129.49
Volume	Sept.	503	204	145
	Aug.	525	213	152

† Official ENR monthly index for Oct.

LABOR

No strike during contract life?

U. S. Supreme Court refuses to review "no strike" decision and adds confusion to Taft-Hartley cooling-off provisions

Six years of litigation and a simple announcement by the U. S. Supreme Court have written a "no strike" clause into every fixed-term collective bargaining agreement.

That's the effect of the high court's little-noted refusal—at the opening of the fall term—to accept for review a decision of the U. S. Circuit Court of Appeals in St. Louis. The Supreme Court thus gave tacit approval to a finding that the Taft-Hartley Act bars any strike during the life of a union contract, even though the contract has a provision for reopening.

Over 8,000,000 workers and half the union contracts now in existence are affected by the action, according to union estimates.

• **History**—The case arose out of the turbulent strike of Iowa and Minnesota CIO packinghouse workers against Wilson & Co., in 1948.

The union was operating under a two-year contract, renewable from year to year, and including a reopening clause with respect to wages. The union, in 1948, gave the required 60-day notice, negotiations failed, and a strike began before the contract had expired.

The employer considered the strike unlawful. It felt that the "cooling-off" provisions of the Taft-Hartley Act effectively placed a no-strike clause in the contract—although its written provisions contained none. Thus, the company reasoned, the strikers lost their status as "employees" and were not entitled to reinstatement.

In the complex litigation that followed, the results were: NLRB held the strike legal and ordered reinstatement of the strikers; the circuit court overruled NLRB and held the strike illegal; and the Supreme Court, by refusing to grant a review, left unchallenged the view of the circuit court.

• **What now?**—It is important to note that the action the Supreme Court took is not the final word—except insofar as the particular litigants are concerned. The same question may come before the high court again, from another circuit and in another case—and with a different result.

The jurisdiction of the circuit court in St. Louis embraces North and South Dakota, Minnesota, Iowa, Nebraska, Missouri and Arkansas. In other areas, the court's decision is a guide—it is not "the law."

Until Congress revises the Taft-Hartley Act, or until the Supreme Court gets the question again, the layman will have to use his own caution and ingenuity.

• **More confusion**—The real result of the tremendous expenditure of time and money, and the indefinite number of oral and written words involved, is merely a change of locks on Pandora's box.

For the courts still have not faced up to the problem of explaining the meaning and the import of the tricky wording of Sec. 8 (d) which contains the cooling-off provisions.

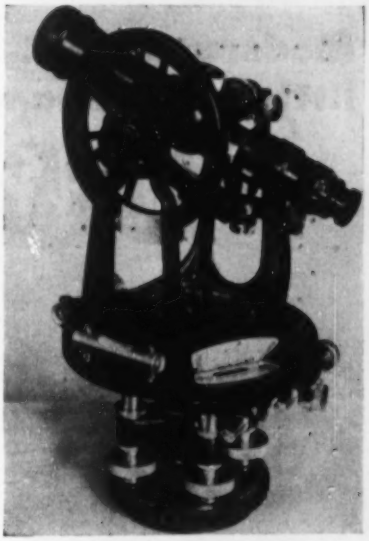
Briefly, these provide that "no party shall terminate or modify" an existing contract, unless it "serves a written notice of the proposed termination or modification sixty days prior to the expiration date thereof, or in the event such contract provides no expiration date, sixty days prior to the time it is proposed to make such termination or modification." It must also continue "in full force and effect, without resorting to strike or lockout, all the terms and conditions of the existing contract for a period of sixty days after such notice is given or until the expiration date of such contract, whichever occurs later."

In its discussion of these provisions, the circuit court noted that contractual rights cannot nullify statutory rights. From this it follows, the court said, that a contract clause granting the right to strike prior to the expiration of a contract would also be invalid.

Under this construction, the long-recognized use of "no strike" and "reopening" clauses in bargaining agreements are superfluous. Another court may even hold a no-strike clause invalid. Thus the task of draftsmen of future agreements has not been made any easier.

• **Dilemma**—The far-reaching effects of this litigation depend upon construction of the quoted provisions. They do not purport to define the

(*Continued on page 50*)



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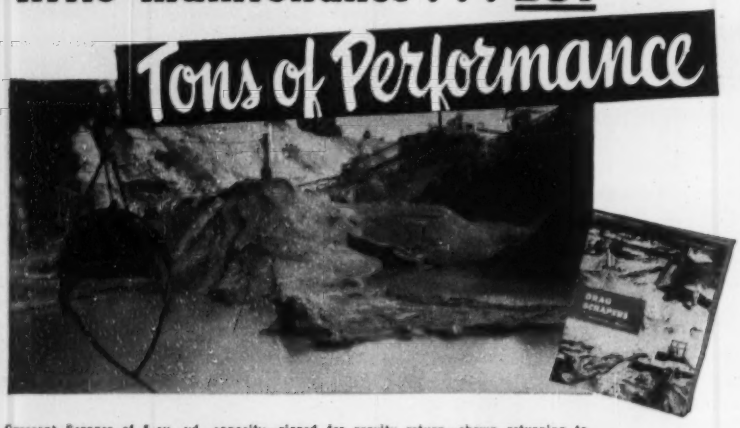

Crescent Scraper of 5-cu. yd. capacity—rigged for gravity return—shown returning to excavation point in the pit. Ask for Catalog A and Field Report 214.

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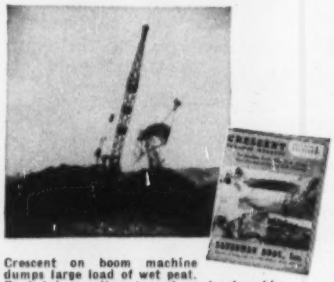
Slackline cableway performs difficult excavation of non-caving material from deep pit, 20% rock and 30% colloidal sand posed tough digging job. Ask for Catalog C and Field Report 216.

Tautline Cableway spans 920 ft. to carry 4-cu. yd. bucket of concrete from mixing point to dam site.



Crescent on boom machine dumps large load of wet peat. Bucket is gravity-returned on track cable to digging point. Ask for Catalog J-1 and Field Report 219.

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right to strike. They define, instead, a phrase that reads "the duty to bargain collectively."

In an effort to find out what they mean, the courts have taken a look at their legislative history. But this field is at best a skimpy one. No attempt was made by the legislators to explain why the law speaks in terms of "modifying" a contract that, for practical purposes, can't be modified, or "terminating" a contract that can't be terminated until it terminates itself.

Similarly, no attempt was made to explain what it considered a "fixed-term," or a "no-fixed-term," or a "renewable" contract.

About all that can be said is that Congress attempted to introduce orderly and peaceful procedures into labor-management relations. On this both the NLRB and circuit court agree. But NLRB says the limit on this was 60 days; the circuit court says the contract "term."

Labor briefs . . .

• **Higher tax**—The Kentucky State Building Trades Council, AFL, has increased per capita assessment on its members from 2 cents to 3 cents. The council at its annual meeting also adopted a resolution calling for the elimination of jurisdictional disputes within its ranks.

• **Strike threat**—A jurisdictional dispute may develop on construction of a 12.4-mi section of the east-west Indiana toll road in Steuben County, over employment of the industrial-type UCW on the project. AFL has notified the Toll Road Commission it will fight such action by contractors.

• **Indictment**—Two former officials of a Washington, D. C., painters' local have been indicted on charges of extortion. They are accused of getting money from two contractors at Andrews Air Force Base, Md., and from one contractor working on a bridge over the Patuxent River near Burch, Md. Amount involved is $3,680.

• **Anti-trust committee**—Arthur J. Goldberg, CIO's general counsel, has asked Attorney General Brownell to limit the jurisdiction of the committee studying anti-trust laws (ENR Oct. 7, p. 74). Goldberg wants the issue of extending those laws to labor unions removed from the committee's investigation, on grounds that the committee does not adequately represent labor. Said Brownell: The committe's jurisdiction extends to "any aspect of the anti-trust laws."

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4278) will be received at Ephrata, Washington, until December 7, 1954, for furnishing labor and materials for earthwork and structures West Part—Block 14, laterals, sublaterals and wasteways, Potholes East Canal laterals, Columbia Basin Project, Washington. Location: near Mesa, Washington, in Franklin County. Principal items are: excavation, 92,700 cu. yds.; concrete, 560 cu. yds.; 3,175 lin. ft. standard strength reinforced-concrete culvert pipe; 1,100 lin. ft. HC50 concrete pressure pipe; 55 flap and slide gates; 12 motor driven pumping units; and other work. Completion time 600 days. For particulars, address Bureau of Reclamation, Boise, Idaho; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Bureau of Public Roads, October 12, 1954. SEALED BIDS will be received at the office of the Bureau of Public Roads, First National Bank Building, Florence, Alabama, until 10:00 a.m. C.S.T., NOVEMBER **10**, 1954, for the construction of Project 3K3-3L7, Natchez Trace Parkway, Choctaw and Attala Counties, Mississippi, 15.076 miles gravel base course, hot asphalt concrete pavement, stabilization of shoulders, and other work from French Camp to Mississippi State Route No. 12. The approximate quantities of the more important items are as follows: 84,000 cu.yd. Borrow for Topping, 71,500 cu.yd. Gravel and 22,000 tons Hot Asphalt Concrete Pavement. Minimum wage rates have been fixed as required by law. Plans, Specifications, and Proposal Forms are available upon request at the address given above, or Bureau of Public Roads, 1440 Columbia Pike, Arlington 4, Virginia. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: November 9, 1954

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE #164, SECTION 1

Route 164, Section 1, from Schiller Street to Route U.S. 1 & 9, City of Elizabeth, Union County. Length 1.749 miles. The principal items of work are: Estimated:

12,105 cu. yds. Roadway Excavation-Earth
7,500 cu. yds. Roadway Excav.-Unsuitable Material
10,000 cu. yds. Borrow Excavation
14,101 cu. yds. Subbase
15,687 sq. yds. 6" Stone Base Course
22,881 sq. yds. 8" Macadam Base Course
17,508 sq. yds. 2" Penetration Macadam Surface
21,017 sq. yds. 3" Pavement Type MA-BC-2
1,175 lin. ft. Rein. Concrete Culvert Pipe
635 lin. ft. Corrugated Metal Culvert Pipe
161 lin. ft. 58"x36" Corrugated Metal Pipe Arch
77 lin. ft. 7'-1"x5'-2" Corrugated Metal Plate Pipe Arch
16 Inlets and Manholes

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, November 9, 1954, at TEN o'clock (10:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of Ten Dollars ($10.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS

Bids: November 23, 1954

Sewage Pumping Station

CITY OF ELIZABETH, NEW JERSEY
NOTICE TO BIDDERS

Sealed proposals for the construction of a Sewage Pumping station in connection with Alterations and Additions to the Sewerage System will be received by the Board of Public Works of the City of Elizabeth, New Jersey, at a meeting to be held in the Council Chamber at the City Hall at 2:00 P.M., E.S.T., on Tuesday, November 23, 1954, and then publicly opened and read. No proposal will be accepted after said hour. Proposals will be received on the following:

Contract 3A—Sewage Pumping Station—General Construction.
Contract 3B—Sewage Pumping Station—Structural Steel Work.
Contract 3C—Sewage Pumping Station—Heating and Ventilating Work.
Contract 3D—Sewage Pumping Station—Plumbing Work.
Contract 3E—Sewage Pumping Station—Electrical Work.

Information for Bidders, Proposal forms, specimen Contract, Plans, Specifications and other pertinent Contract Documents for any or all of the foregoing contracts may be examined at the office of Henry Kreh, Jr., Consulting Engineer, 51 First Street, Elizabeth, N. J.; Alexander Potter Associates, Associate Engineers, 50 Church St., New York, and at the office of the City Engineer, City Hall, Elizabeth, N. J., between the hours of 10 A.M. and 4P.M. daily except Saturdays, Sundays and holidays and there obtained upon making a deposit of Fifty ($50.00) dollars, which will be refunded to bidders within thirty (30) days after the proposals are opened and upon return of the data undamaged. Half of this deposit will be refunded to nonbidders.

Extra copies of specifications may be obtained at the cost of Ten ($10.00) dollars each and extra sheets may be obtained at the cost of One ($1.00) dollar each which sums will not be refunded.

The work involves approximately 4800 cu. yds. of excavation; 1450 cu. yds. of concrete; 17 tons of structural steel; five pumping units totaling 51 m.g.d. capacity.

Prospective bidders will be required to fill in answers in Questionnaire of Financial Statement which is authorized by State Law and which must be approved by the Board of Public Works before bidders are eligible for bidding. Questionnaire forms may be obtained at the office of the City Engineer.

No proposal shall be considered unless accompanied by a Bid Bond of a corporation acceptable to the City, or a cashier's check or a certified check upon some good and acceptable bank, in the penal sum of 10% of the total amount of each bid as a guarantee that if the contract upon which the bidder has bid shall be awarded to said bidder, he will enter into a contract for the work and do so within the time stipulated in the Notice of Award for said work and failing to do so the bidder and surety shall forfeit to the City of Elizabeth, the amount of said Bid Bond or check. The Bid Bond shall be executed by the bidder and surety company on form furnished by the City.

A bidder to whom a contract is awarded shall furnish a Performance Bond on a surety company duly licensed in the State of New Jersey, in the sum of 100 per cent of the amount of the contract, conditioned upon the faithful performance of the terms of the contract.

The successful bidder will be required to comply with all State Laws governing the execution of Municipal contracts in the State of New Jersey.

The Board of Public Works reserves the right to reject any and all bids as it may deem best for the interests of the City of Elizabeth, and to waive any informality in the bid.

BY DIRECTION OF THE
BOARD OF PUBLIC WORKS.
GEORGE F. CUMMINGS
Clerk, Board of Public Works.

Dated Oct. 28-Nov. 4, 1954.

OFFICIAL PROPOSALS

Bids: November 17, 1954

INDIANA TOLL ROAD COMMISSION
309 W. Washington Street
Old Trails Building
Indianapolis, Indiana

NOTICE TO BIDDERS
Contract C-28/29
Contract C-30
Contract C-28/29 and C-30

Sealed proposals will be received by the Indiana Toll Road Commission at or before 11:00 A.M., Central Standard Time, November 17, 1954 for the performance of each of the contracts enumerated above.

CONTRACT NO. C-28/29

The grading, drainage, structures and paving of approximately 2.6 miles in Construction Section C-28/29 of the Indiana East-West Toll Road beginning at a point about 75 feet west of the St. Joseph River at Toll Road Centerline Station 4213+60 in St. Joseph County and extending eastwardly to a point about 1,219 feet west of Ironwood Road at Toll Road Centerline Station 4348+00 in St. Joseph County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	280,000 Cu. Yds.
Borrow	1,015,000 Cu. Yds.
10" Reinforced Concrete Pavement	101,100 Sq. Yds.
Culvert Pipes and Underdrains	6,500 Lin. Ft.
Cast-in-Place Concrete Piling	35,100 Lin. Ft.
Concrete for Structures	12,110 Cu. Yds.
Reinforcing Steel	1,409,660 Lbs.
Fabricated Structural Steel	3,176,000 Lbs.

CONTRACT NO. C-30

The grading, drainage, structures and paving of approximately 4.0 miles in Construction Section C-30 of the Indiana East-West Toll Road beginning at a point about 1,219 feet west of Ironwood Road at Toll Road Centerline Station 4348+00 in St. Joseph County and extending eastwardly to a point about 6,630 feet west of the Grand Trunk & Western Railroad at Toll Road Centerline Station 4557+00 in St. Joseph County, Indiana. The approximate quantities of the major items of construction are as follows:

Common Excavation	274,000 Cu. Yds.
Borrow	452,000 Cu. Yds.
10" Reinforced Concrete Pavement	106,086 Sq. Yds.
Culvert Pipes and Underdrains	8,338 Lin. Ft.
Cast-in-Place Concrete Piling	14,200 Lin. Ft.
Concrete for Structures	3,700 Cu. Yds.
Reinforcing Steel	570,925 Lbs.
Fabricated Structural Steel	1,407,400 Lbs.

The work covered by Contract C-28/29 and C-30, which covers a combination of Construction Sections C-28/29 and C-30, is the construction as above described for the individual Construction Sections, taken together.

Copies of the Plans, Specifications and Proposal Forms for said Contracts are available for public inspection or purchase at the office of the Chief Engineer, Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for the Indiana East-West Toll Road.....$ 5.00
Plans, Special Provisions and Proposal Forms, per set, per Construction Section $25.00

Informational Drawings

Cross-Sections, per set, per Construction Section $25.00
Soil Plan and Profiles, per set, per Construction Section .....$ 5.00

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Contractor's statement for qualification on the forms supplied by the Commission will be required from all Bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5%) per cent of the total price bid per Construction Section covered by the Contract. If the Bidder shall tender bids for two or more Contracts which include the same Construction Section, the Construction Section thus duplicated in the bidding need be counted only once in determining the total amount of the Proposal Guaranty. The Proposal Guaranty shall be in the form of an acceptable surety bond or a certified check on a solvent bank.

If the Bidder is an out of state corporation, he shall be required to furnish a certificate from the Secretary of State of Indiana as evidence that the corporation has

(Continued on following page)

OFFICIAL PROPOSALS
(Continued from preceding page)

complied with the Indiana Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Indiana.

All bids must be received at or before 11:00 A.M., Central Standard Time, November 17, 1954, in the offices of the Indiana Toll Road Commission, 309 W. Washington Street, Indianapolis, Indiana. At said hour, the bid box will be publicly opened and the bids read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

INDIANA TOLL ROAD COMMISSION
Charles W. Keating — Dr. Dillon Geiger
Secretary-Treasurer — Chairman

Bids: November 23, 1954

Sprinkler and Standpipe Systems For Buildings Nos. 129, 142, 143 and 144

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
CONTRACT PN-250.004

Sealed proposals for furnishing and installing sprinkler and standpipe systems throughout Buildings Nos. 129, 142, 143 and 144 at Port Newark, New Jersey, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, November 23, 1954, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, October 28, 1954

Bids: November 3, 1954

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a. m., Eastern Standard Time, the 3rd day of November 1954, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the construction of structures and the grading, drainage and paving of the Turnpike Section 37-C, part of the Northeastern Extension of the Pennsylvania Turnpike in Kidder Township, Carbon County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 874 feet northwest of the centerline of an existing gravel Park Road at Turnpike station 1136+50 in Kidder Township, Carbon County; thence in a northwesterly direction 15,314 feet more or less to Turnpike station 1289+63.53 at a point approximately 3,608 feet northwest of the centerline of Legislative Route 408, Traffic Route 940 in Kidder Township, Carbon County, a distance of approximately 2.90 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation....934,801 cubic yards
Class II Excavation...10,930 cubic yards
Class 2A Excavation...2,538 cubic yards
Special Subgrade.....158,169 square yards
Reinforced Concrete Pavement.....96,863 square yards
Class A Concrete.....2,407 cubic yards
Class B Concrete.....5,280 cubic yards
Plain Steel Bars.....463,760 pounds
Fabricated Structural Steel.....673,000 pounds
Median Divider.....14,176 lineal feet

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on October 21, 1954. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set.

Plans and contract documents, for this section exclusive of cross-sections and specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. Money Order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
14 October 1954

Bids: November 23, 1954

Office of Purchasing Agent City of Nashville, Tennessee

BIDS FOR PROJECT NO. 54-SD-2
NASHVILLE, TENNESSEE

Sealed proposals or bids will be received by the City Purchasing Agent of the City of Nashville, Tennessee, at Room 209 Courthouse—City Hall Building, until ten (10) o'clock A.M., on the 23rd day of November, 1954, for furnishing of all materials, labor, tools, and appliances necessary for construction of:

LEFT BANK DOWNSTREAM OPEN-CUT INTERCEPTOR SEWER

Copies of the proposal, contract, documents, plans and specifications, may be obtained from the office of Rice, Harwood and Clark, Architect-Engineers, 903 American Trust Building, Nashville, Tennessee.

A charge of THIRTY-FIVE.....($35.00) DOLLARS will be made for each set of contract documents, proposal, plans and specifications. Deposit will be refunded in full amount applicable to the first set obtained and returned by contractors submitting a bona fide bid. Deposit, less one-half principal sum thereof retained to cover cost of production and handling, will be refunded on all other sets returned within ten (10) days after opening of bids.

Each proposal or bid must be accompanied by a cashier's or certified check on a State or National Bank made payable to the City of Nashville, Tennessee, or a bidding bond executed by the bidder and a surety company authorized to transact business in the State of Tennessee, in the sum of not less than five (5%) per cent of the total amount of the bid. Said check or bond will be returned to the unsuccessful bidders as soon as contract has been awarded and to the successful bidder as soon as he has executed the contract and furnished the necessary bonds, and the same have been approved by the City Attorney and the contract has been executed by the City.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee. Bidder's name and license number must be placed on the sealed envelope containing these documents.

OFFICIAL PROPOSALS

All bids must be made out on proposal form bound in the specifications. No interlineations, additions or deletions shall be made in the proposal form by bidder. The proposal form must not be detached from the specifications.

The City of Nashville, Tennessee, through its Mayor, reserves the right to reject any and/or all bids, to waive any informalities in the bids received and to accept any bid, which, in its opinion, may be for the best interest of the City.

E. B. SMITH, Purchasing Agent
The City of Nashville, Tennessee.

Bids: November 16, 1954

New Jersey Turnpike Authority

CONTRACT NOS. N-47A & N-47B

Proposals are invited for Contract Nos. N-47A & N-47B which, in connection with the Newark Bay-Hudson County Extension of the New Jersey Turnpike, involve the relocation of water supply and sewerage systems and the relocation of electrical distribution and fire alarm systems, respectively, and other incidental work on U. S. Government property at Caven Point Terminal, Jersey City, New Jersey.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Standard Time on the morning of November 16, 1954, at which time and place said proposals will be publicly opened and read.

Bidders must submit with their proposal as Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after October 28, 1954, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Five Dollars ($5.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

October 28, 1954

Bids: December 3, 1954

Philadelphia, Penna. Procurement Department Water Department

Sealed proposals will be received in Room 313, City Hall Annex, until 2:30 P.M., Eastern Standard Time, Friday, December 3, 1954, and opened at that time, for Bid No. 2269—Contract No. SD-184-SW.

Central Schuylkill Force Mains and Gravity Conduit in Private Property, University Avenue and City Property from a point 77.50 feet N.E. of 46th Street and Paschall Avenue to a point 68.75 feet S.W. of the Central Schuylkill Pumping Station.

PRINCIPAL ITEMS OF WORK

1284 ft. of 8'0" diameter concrete gravity conduit in tunnel
1071 ft. of 8'0" x 8'0" reinforced concrete gravity conduit in open cut
966 ft. of twin 60 inch dia. C.I. pipe force main in open cut on timber piles
567 ft. of twin 60 inch dia. C.I. pipe force main in open cut on earth
111 ft. of one 60 inch dia. C.I. pipe force main in open cut on piles

Proposal forms, questionnaires, and specifications may be obtained from the Water Department, in Room 1131 City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 51 North 13th Street, Philadelphia, Penna.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1106 City Hall Annex, at least one (1) week prior to the date of opening bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal form.

Michael Sura, Acting Commissioner

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)

$1.80 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.80 a line an insertion.

INFORMATION:

BOX NUMBERS count as 1 line additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:

The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office, 330 W. 42nd St., N. Y. 36 for November 11th issue closing November 1st

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SALES ENGINEER
ARCHITECTURAL PRODUCTS

Growing Wisconsin manufacturer expanding in architectural field needs experienced field sales engineer. Will work directly under General Sales Manager to develop additional applications for nationally known building product line. While we've been in business over five decades, this is a hustling young Organization with 250 employees and lively new product lines. Man selected will spend about 50% of time in field, balance at plant located in pleasant Southern Wisconsin community. For interview, write us, giving details of your education, experience, age and salary history.

P-4356, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
STRUCTURAL ENGINEER

Familiar with steel and concrete design.

Apply to:
C. A. REDDEN, *Chief Engineer*
Hollingsworth & Whitney Company
Waterville, Maine

MECHANICAL ENGINEER

Midwest Consulting Office of forty-years standing in Municipal and Industrial field has fine opening for experienced designer of heating, ventilating, air conditioning, plumbing (and electrical). Fine town, fine clientele. Permanent for right man. State salary requirement.

P-4230, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CONTROLLER

Young, aggressive Southern firm operating in the South, Southeast, Southwest, West and Midwest desires services of a controller with construction experience. Only persons of high calibre with executive ability need apply. Reply fully giving age, education, experience, when available and salary desired.

P-4168, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

DESIGNING ENGINEERS
Experienced
Structural Steel & Foundation Design
Bridges, Conveyors, Highways
Draftsmen with varied experience
Mail complete resume' with salary requirements

TRYGVE HOFF & ASSOCIATES
1922 E. 107th St. Cleveland 6, Ohio

WANTED
EXPERIENCED SALESMAN

For Heavy Construction Equipment
In Northern New Jersey
Must know Territory

SW-3880, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

Dealer Inquiries Invited **NOW**

Fast, easy way to
CUT WIRE ROPE
Low cost, portable, safe
For details mail ad to

MONTGOMERY MFG. CO.
24 Z Austin St., Newark 5, N. J.

ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, and Electrical Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of project and process engineering. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30
ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE, NEW YORK 22, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

JR. CIVIL Engineers. Instrumentmen. Map Draftsmen needed for expanding Highway Program in Nevada. State Personnel Department, Carson City, Nev.

CIVIL ENGINEER — competent and experienced in the preparation of detailed specifications and contract documents for water works and sewerage projects, mechanical and electrical work. Location — Central Ohio. Consulting engineers office. Permanent position intended. State experience, when available and salary requirements. P-4220, Engineering News-Record.

EXPERIENCED ENGINEER as construction superintendent to take complete charge of large sewer job. Permanent connection to right man. Salary plus bonus. Give complete resume of background and experience. P-4225, Engineering News-Record.

IRRIGATION ENGINEER with agricultural, hydraulic and construction experience to design and supervise installation small irrigation systems South and Southeast. Permanent position with rapidly expanding firm. Excellent opportunity for ambitious young man. Submit resume, age, education, experience, list of references, salary requirements, availability. Box P-4226, Engineering News-Record.

BRIDGE—HIGHWAY Engineers—Designers—Draftsmen. For work on bridges, expressways and turnpikes. Location Midwest. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include education, experience, reference and salary expected in application letter. P-4280, Engineering News-Record.

WANTED: CIVIL Engineers, one with 0-3 years experience and one with over 10 years experience in structural engineering; background in design of waterway and water-control structures desirable, but not necessary. Permanent positions, opportunity for advancement. Address inquiries to: State of Illinois, Department of Public Works and Buildings, Division of Waterways, 201 West Monroe Street, Springfield, Illinois.

(Continued on page 54)

Don't forget the
BOX NUMBER

When answering the classified advertisements in this magazine, don't forget to put the box number on your envelope. It's our only means of identifying the advertisement you are answering.

WANTED
CRUSHER SALES ENGINEER

Well-known, midwest manufacturer of complete line of crushers and other machinery for Quarries, Gravel Plants and Contractor Aggregate Producers has excellent opportunity for experienced sales engineer to work with several good distributors and their salesmen in Southeastern States.

Headquarters would be in or near Atlanta, Georgia and territory consists of the states south of and including Tennessee and North Carolina and east of the Mississipi River. This is a permanent, well-paying position with the opportunity to become Southeast District Manager and to increase earnings after showing ability to produce results.

Give complete outline of education and experience and submit recent snapshot or photograph, if available. All replies held absolutely confidential.

P-4337, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

ASSISTANT CHIEF ENGINEER

We are seeking a top steel designer and stress analyst experienced in industrial buildings, rigid frames and general construction work.

This is an outstanding opportunity for a progressive engineer with ingenuity, administrative ability and mature judgment. Familiarity with electrical and mechanical design would be an additional asset.

Our plants and engineering department are located in Bethlehem, Pennsylvania.

Address application to

MR. BURRELL H. TRIPP
Executive Vice-president
LURIA ENGINEERING COMPANY
511 Fifth Avenue
New York 17, New York

WANTED
Heavy Construction Superintendent

Permanent position. Immediately for large size foundation job in New York State. Must be thoroughly familiar with steel cofferdam construction. Top salary for aggressive individual with ability to push work through to early conclusion. Give detailed qualifications and experience in first letter.

P-4382, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT
(Continued from page 53)

SUPERINTENDENT FOR General Contractor must be familiar with concrete construction, masonry, etc. and capable of supervising and coordinating subcontractors work. State fully experience, age, when available and salary requirements. Blount Brothers Construction Company, P. O. Box 1144, Montgomery, Ala.

FULL TIME salesmen wanted with knowledge of abrasives, and having contractor contacts. Metropolitan New York, New Jersey and Connecticut. Salary plus commission. P-4295, Engineering News-Record.

MILLWORK — (WOOD) — Detailer-estimator-salesman. Must have complete knowledge of all types of millwork. New organization of established millwork shop. A real opportunity for qualified person. Send complete personnel record to Wooten Millwork Co. Box 3283 Fayetteville, N. C.

EXPERIENCED STRUCTURAL Steel Detailer for small shop in Middle West. Submit complete resume to Berger Steel Co., Inc., Lafayette, Indiana.

SERVICE MANAGER — Experienced service manager to handle complete branch store service operations, Eastern Caterpillar distributor. Submit qualifications, age, experience, availability, and salary requirements. Write P-4359, Engineering News-Record.

ESTIMATOR — FOR smaller general contractor, North Eastern Ohio, doing sewage and water plants, bridges, etc. Give full information first letter. P-4360, Engineering News-Record.

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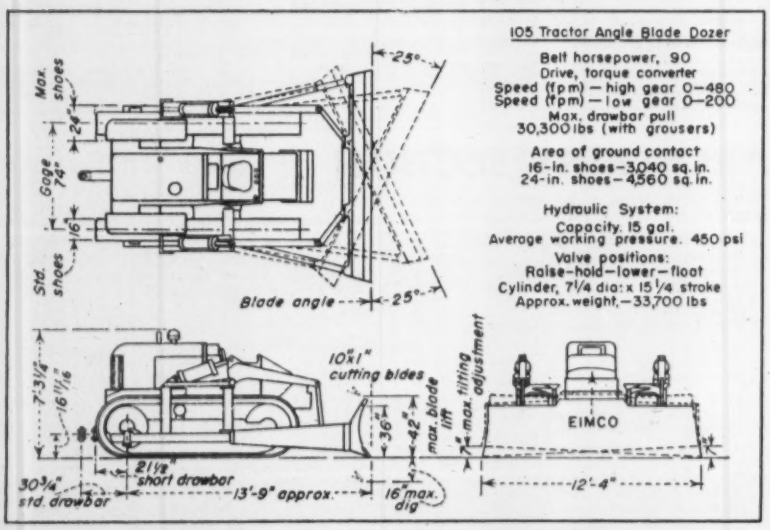
BULLDOZER is fitted to Eimco's 105 prime mover at the Salt Lake City plant.

The Eimco 105 gets a dozer

Stripped of its rocker-loading shovel, the spin-turning 105 can be mounted with a new 12-ft 4-in. bulldozer blade

Announced last year (ENR Nov. 12, 1953, p. 108) as a new entry in the tractor-shovel competition, the Eimco 105 is now available with a hydraulically positioned blade for bulldozing operations.

In this year of the giant tractors, the 105's 90-hp diesel may not make such a tremendous impression. However, with grousers, the prime mover develops a drawbar pull of 30,300 lb at low-bulldozing speeds. An Allison torque converter and constant-mesh gear trains transmit power to the tracks.



All of the maneuverings of the tractor are controlled by two levers. Moving both levers forward results in a forward motion of the tractor. Pull both backward and the machine reverses.

A spin turn is accomplished by twisting the levers, that is, by pushing one forward and pulling back on the other. Pushing or pulling one lever results in a slow turn that may be speeded by applying the brake to the "dead" track.

Another feature of the 105 is the operator's position. On this rig it's right up front. Indicative of Eimco thinking is the statement, "Driving from the back seat is all right for pulling plows but not for bulldozing." The forward housing has therefore been sloped downward in order to increase visibility.

The blade itself is 12 ft. 4 in. long and can be angled through 25 deg in either direction. It can be tilted 7 in. on either side and raised to 42 in. above ground level or lowered 16 in. for digging. THE EIMCO CORP., SALT LAKE CITY 10, UTAH.

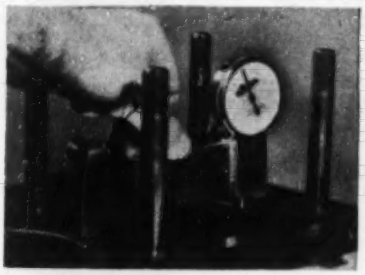
Overhaul kit simplifies diesel engine maintenance

An overhaul kit, specifically designed for GM-71 series diesel engines, includes not only instruments for setting valve clearance, timing fuel injectors and balancing fuel injector racks, but also provides adaptors for accurate measurement of height of cylinder liners, uniformity of counterbore, uniformity of cylinder bore, and cylinder liner wear when overhauling or rebuilding the engines.

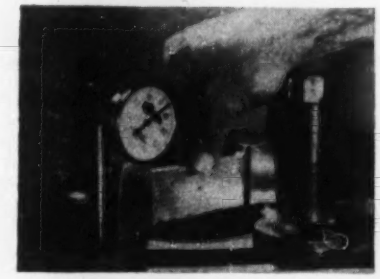
The basic instrument of the kit is the Model 201 Valve-Gapper which is used for setting valve clearance, timing fuel injectors and balancing fuel injector racks. All measurements register on the dial indicator, calibrated to .001 in.

According to the manufacturer, the Model 201 can also be used to set clearance on GM 6-110 engines, and adaptors will soon be made available to the industry for timing injectors and balancing fuel racks on these engines.

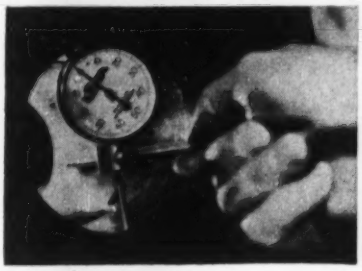
Most operations are accomplished in three simple steps. To adjust valve gap, for example, the instrument is placed on the valve spring retainer and held firmly between it and the rocker arm by spring pressure in the Valve-Gapper. The valve gap is then closed by hand pressure and the dial



Measuring uniformity of counterbore.



Measuring height of cylinder liner.



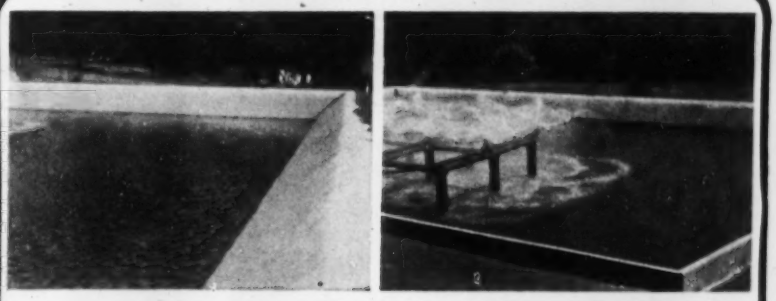
Measuring cylinder bore.

indicator needle adjusted to zero. Pressure is then released and the clearance registers on the dial. Using both hands, the mechanic then adjusts the gap in the normal manner until the dial indicator needle points to the engine manufacturer's recommended clearance.

This new principle in setting valve clearance is said to be accurate, regardless of the condition of rocker arm or valve stem, since the instrument measures the entire travel of the rocker arm prior to contact with the valve stem.

The complete overhaul kit consists of the Valve-Gapper, micrometer plug gauge, timing attachment, "D" engine control tube adaptor, dial indicator handle, dial indicator, standard-cylinder bore, standard-cylinder liner, combination master gauge and holder. P&G Mfg. Co., 2262 N. Albina Ave., Portland 12, Ore.

(*New Products continued on page 64*)



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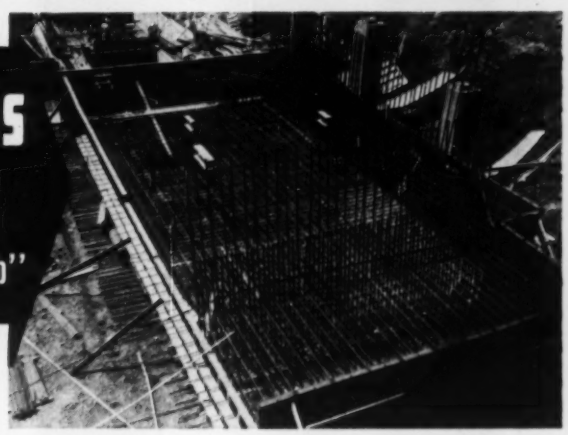

Alabama Power Company's Gorgas Steam Plant Unit No. 8 is among the many construction projects using Connors' Concrete Reinforcing Bars.

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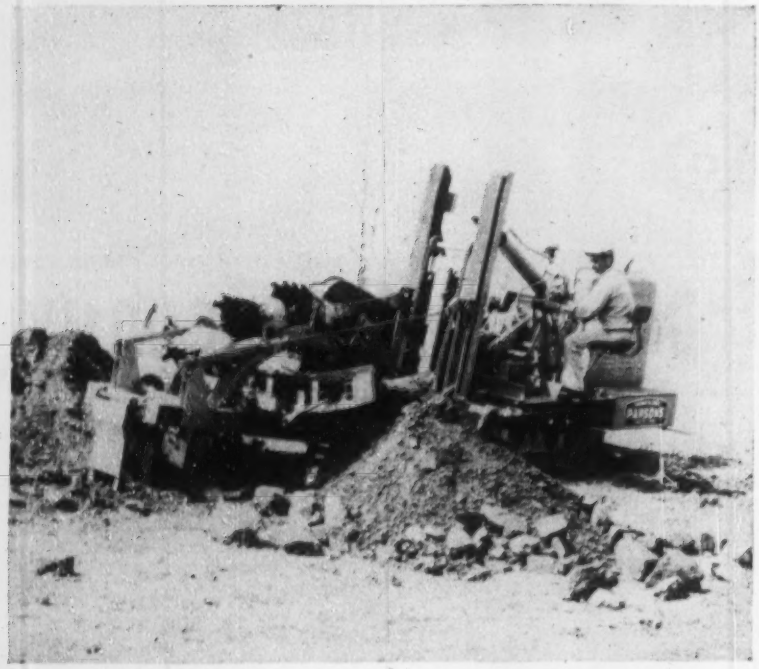


TRENCHLINER has hydraulic rams for accurately positioning the digging wheel.

Digging wheel has hydraulic control

Hydraulic control of the digging wheel is the important feature on the new Model 150 wheel-type Trenchliner. A hydraulic ram raises and lowers the wheel on a vertical mast and reportedly holds it to close grade tolerance at any depth. A separate hydraulic ram tilts the mast to carry the weight of the wheel forward on the machine for proper balance when traveling, loading or unloading on trucks or trailers.

According to the manufacturer, the Model 150 produces from 12 in. to 25 ft of trench per minute. With a digging capacity of 5¾ ft deep and 16 to 26 in. wide, it has potential for drainage work, pipeline installations, irrigation projects, general utility and construction work. It is equipped with a range of 30 digging feeds, and three speeds on the heavy-duty digging wheel up to 11.25 r.p.m.

Other features incorporated in the new 150 Trenchliner include: a shiftable and reversible belt conveyor that discharges spoil to either side; dual purpose, friction type clutch on digging wheel drive that acts as an automatic safety to protect machinery against shock loads; solid or tine-back buckets with gumbo lips or tap-in type teeth; retractable bucket-cleaner; optional tile box and chute. A gasoline or diesel engine is available, according to choice.

With three point suspension mounting, the weight of the 150 Trenchliner is said to be distributed over the full crawler mounted tractive system. Bearing pressure is 6 or 8 psi, depending on the use of 16 or 12 in. lug type treads. PARSONS CO., NEWTON, IOWA.

Cam lift booster permits longer trailers, bigger pay loads

A cam lift booster mounted over the fifth wheel of Hobbs Schonrock cable dump trailers is designed to reduce strain on the entire unit during dump cycles.

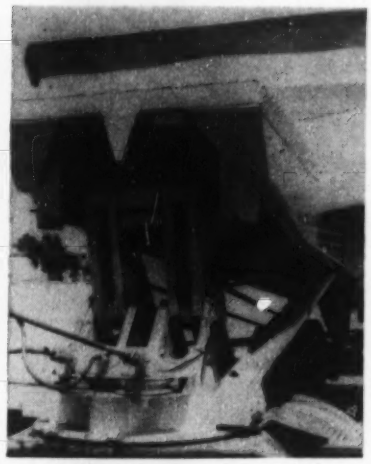
Under the cable dump principle, lifting arms jack-knife the trailer into dumping position as the rear wheels are pulled toward the tractor by means of cables. The rotating cam-lever-sheave device raises and supports the front end of the trailer during the first ten percent of the dump cycle when greatest inertia forces must be overcome and when the lifting arms are at the most disadvantageous angle.

The booster is said to cut initial line pull by 75 percent and thus lengthen the life of both winch and cable. It is further pointed out that: frame strain is eliminated; torque required by motor to raise load is reduced; cable tension is allowed to build up gradually and smoothly; longer trailers and therefore increased payloads are permitted.

Other improvements and specialized attachments noted in the company's cable dumps are: strengthened center frame and side rail construction; semi-automatic cutaway fifth wheel to provide easy disconnecting or re-engaging of a trailer; cable-releasing attachment permitting complete disconnection of trailer from truck; restraining bracket to prevent upper fifth wheel from rising at front during dump cycle; hot mix spreader and re-

Ditch cleaner slashes 4-in. roots

A tractor-mounted ditch cleaner was recently introduced in Britain. The retractable circular cutter reportedly cleans ditches up to 4½ ft wide and 3 ft deep. Further, it is pointed out that the cutter slices 4-in. roots with the greatest of ease.



movable batch gate attachment for use in working with concrete paving machines. Hobbs Mfg. Co., Box 1568, Ft. Worth 6, Tex.

Soil tester features light weight and compactness

A new machine has been developed for performing consolidation tests on soils. Called the Conbel, the machine is a hydraulic device for applying loads to the test samples.

Compact, the 40-lb machine occupies less than 1 cu ft of space yet it has a reported capacity of 20,000 psf and a sensitivity of 67 psf on a 2½-in. dia sample. Further, new pressures can be adjusted to the desired value while the existing load is maintained. According to the manufacturer, the new load is applied instantaneously, without shock, by opening an oil cock. An air pressure source of 30 to 40 psi is required for operation. Tinius Olsen Testing Machine Co., Easton Rd., Willow Grove, Pa.

Formula provides combination primer and knot sealer

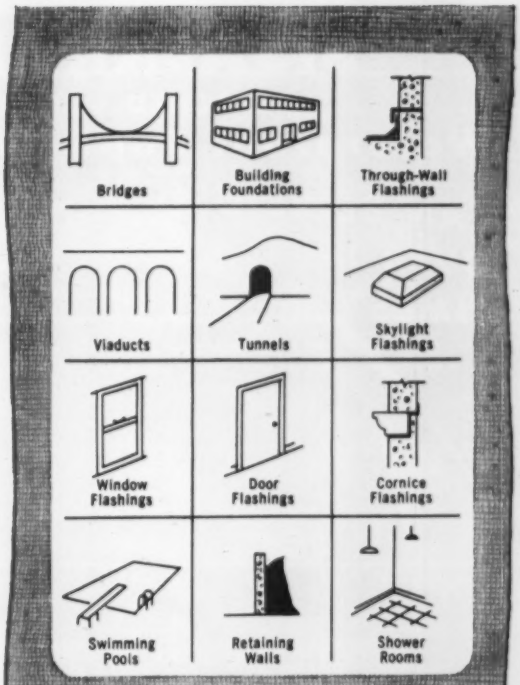
A special formula has been developed for making a combination primer and knot sealer to be used in painting knotty grade woods. The formula, designated WP-578-P, is a further development of clear sealer WP-578 the Western Pine Ass'n. released for manufacture several years ago.

The new formula eliminates one step in the sealer-primer-paint sequence heretofore necessary when painting knotty grade woods. Now the primer and sealer may be applied in one application.

The knot sealer was originally developed to prevent knot discoloration burning through painted surfaces, and

(Continued on page 66)

what's your waterproofing problem?



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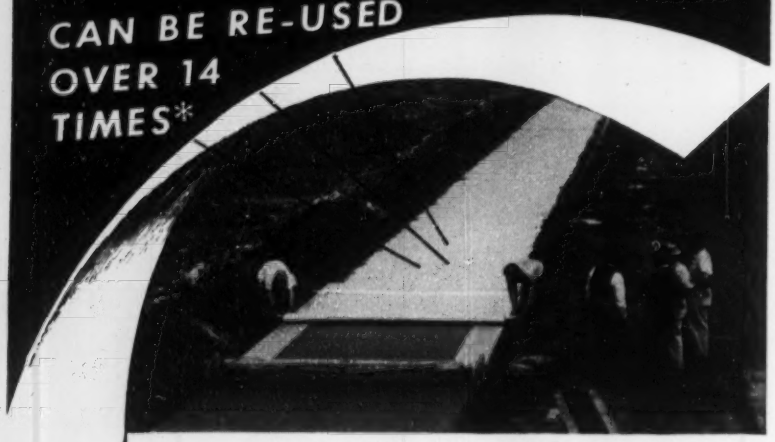

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NEW PRODUCTS

hence allows increased use of exterior Economy siding and knotty grade paneling for painted use. To date, the laboratory reported, approximately 20 manufacturers have indicated they will produce the new formula for national distribution. Names of manufacturers may be obtained by writing the Western Pine Ass'n., 510 Yeon Bldg., Portland 4, Ore.

Blueprint rack offers savings in time and space

A new blue print rack, called the Glider, has as one of its features a specially designed clamp that eliminates the need to punch holes in each set of prints and holds any thickness of sets. It is tightened or opened by thumbscrew adjustment to permit insertion or removal of prints or sets of prints, and any sheet in a set can be replaced without removing other sheets. The special clamp can also accommodate various sizes of prints and can hold from one to one hundred sheets.

Each Glider rack can hold twelve to eighteen sets of drawings, and a visible index shows the location of each set. Adjustable tracks allow for varying thicknesses of sets and thus utilizes minimum space. The rack is of all-steel construction, finished in grey to harmonize with other office furniture.

The rack can be taken apart and reassembled and thus can be shipped from one project to another. This eliminates the expense of building wooden racks and destroying them when the job is done.

The manufacturer also offers a rack extension unit that can be added to the basic unit at a saving over another complete unit. In addition, the company offers a shelf with compartments for filing specifications. The Glider can also be had in a deluxe cabinet style, completely enclosed, with lock.

The single unit Glider is 5 ft high, 4 ft wide and 3 ft deep; price is $89.50.. Momar Ind., 4323 W. 32nd St., Chicago 23, Ill.

Name change

Geocon Ltd. is the new name of the former Gunite & Waterproofing Ltd. with offices in Halifax, Montreal, Toronto and Dorval, Can..

Change of address

Offices of the Cast Iron Pressure Pipe Institute are now located in the Pennsylvania Bldg., 425 13th St., N.W., Washington 4, D. C.

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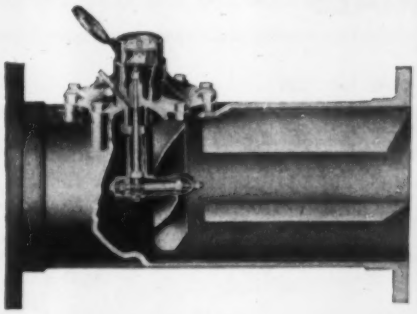

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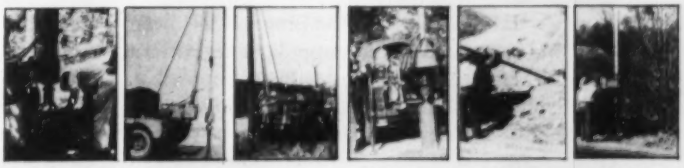

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EDITORIALS

Flood damage can be cut

RAINS OF SUCH UNCOMMON INTENSITIES as 7 in. in 24 hours, occurring in successive weeks in such unexpected places as Chicago and Toronto, emphasize again that every community has a flood protection problem of some kind. It may be only that low, flat areas need some means of quick drainage, that building basements need watertight doors, or that some small, normally placid stream requires a wider channel or a flood wall. But whether protection takes the form of small facilities like these, or assumes the proportions of Mississippi River levees and floodways, it sooner or later will prove to be a worthwhile investment.

The "freak" storms that have plagued the eastern part of the country this Fall have a certain value in focusing attention on this fact. Some dozen years ago when a tropical hurricane veered westward into New England, the possibility of its happening again was considered remote. Yet three subsequent storms have followed a similar pattern. Last week a hurricane set new rainfall records in Washington, D. C. and then took an unprecedented course up the Ohio Valley. Obviously the vagaries of the weather could cause it to happen again. Even the strange meteorological conditions that kept a local storm hovering over Chicago for more than 24 hours are subject to a repeat performance.

So, floods can occur almost anywhere, and not just once but repeatedly. It is equally obvious that the damage they cause can be cut by proper protection measures—as was demonstrated last week in Pittsburgh: upstream storage dams and city flood walls reduced damage to a fraction of what it would otherwise have been.

Pittsburgh's good fortune was a direct result of facilities provided by the civil works program of the Corps of Engineers, during a time when this program received more support than it has in recent years. It is true that the $500 million budgeted for this work this year and next is a sizeable sum. Yet it buys only as much flood protection as the $200 million expenditures of 20 years ago did. Worse still, the program has been turned on and off in such an unpredictable pattern that concerted, efficient progress has been impossible.

General Samuel B. Sturgis, Chief of Engineers, has urged repeatedly that some sort of a floor be placed under civil works expenditures and that they be spread over a wider geographic base, so that his organization can be operated more efficiently. Both of these improvements should be made. In addition, what seems to be the ceiling for flood protection expenditures at present should be raised to a level more consistent with today's needs and costs. If to such improved federal flood protection measures were added those which communities should undertake with their own funds, flood damage, even from wandering hurricanes can be measurably cut. Sensibly managed, which means patterned to what we can afford, such a program can return many times the tax money that goes into it

CIMA—worth knowing about

THE CONSTRUCTION INDUSTRY is full of technical societies and trade associations whose designating initials are so well known that they immediately suggest what manner of service they represent. ASCE, ASTM, AISC, PCA, AASHO, are examples, and each contributes in its special way to the functioning and progress of construction.

One set of initials not as familiar as it should be, considering the importance to construction of the organization it designates, is CIMA. The initials stand for Construction Industry Manufacturers Association, which is the trade association of the companies that supply the machines whose use has made U.S. construction the envy of the world. Lack of familiarity with CIMA results from the fact that it is a relatively new organization, and not from any lack of effective service it has rendered during its short life.

Basically, of course, CIMA's objective is to serve its members by giving them a collective voice, by affording them a clearing house for statistical information, by fostering sound manufacturing and equipment financing techniques and by doing all those cooperative chores that a trade association is equipped to do. But CIMA has gone much farther by effectively fostering progressive practices in the construction industry that it serves. It contributes sizeably to the support of the American Road Builders Association. It runs the vastly educational Road Shows that are periodically a part of ARBA activities. It assists in financing the work of the International Road Federation. During the war it served the government in handling material allocations to its members, assuring a supply of construction equipment to the armed forces and to contractors. And in many other ways it serves the vital interests of engineers and contractors, as well as those of its own members.

CIMA is presently inaugurating a drive for membership among the minority of construction equipment manufacturers who have not yet joined its ranks. With these companies added to present membership, CIMA can truly represent the entire industry, and thus enlarge its influence and service commensurately. But a prime objective of the membership drive is to assure that the 1957 Road Show in Chicago will omit no type or make of equipment which can contribute to more efficient construction. On that score alone the construction industry has a proper interest in its success. CIMA's efforts are worth supporting.

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The MacClosky company is working on the interchange in the left center of the above picture. At right, MacClosky's crane with Yellow Strand Wire Rope, sets a concrete bucket into pouring position.

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CHARLES MacCLOSKY CO. SPEEDS LINK IN LOS ANGELES ROAD SYSTEM

In one 16-hour period, more than 144,000 vehicles of all types passed through the major intersection of the Santa Ana Freeway, the Ramona Freeway and the Hollywood Freeway in Los Angeles. To provide safe passage for these many motorists, an interchange is being built at the intersection. The three-way interchange will allow traffic to flow without interruption on the busy Freeways.

Charles MacClosky Co., of Los Angeles, is the contractor on the important project. Scheduled for completion in May of '55, the contract is kept ahead of schedule by skillful planning of work and equipment. Heavy traffic continues to flow while the work progresses.

At present, bottom decks and stems of the cantilevered, hollow-box girder bridge are being poured. A Moto-Crane is used to lift ¾ yd. concrete buckets to pouring position. The crane, like all MacClosky machines, is equipped with Yellow Strand Wire Rope. The hoist line and boom lines are ⅝" 6 x 19 Preformed Yellow Strand, IWRC.

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